DOCUMENT RESUME

ED 192 007 CE 026 155

TITLE A Career Guidance Curriculum for Ninth Grade Students. Occupational Cluster Learning Activities. Health-Technical. Part 2 of 2. Ninth Grade Career Guidance Project. Project Duration: July 16, 1979, to June 30, 1980.

INSTITUTION Cape May County Vocational Schools, N.J.

SPONS AGENCY New Jersey State Dept. of Education, Trenton. Div. of Vocational Education.

PUB DATE [80]

NOTE 212p.; For related documents see CE 026 153-154.

EDRS PRICE MF01/PC09 Plus Postage.

DESCRIPTORS Allied Health Occupations; Auto Mechanics; *Career Awareness; Career Education; Career Exploration; Career Guidance; Child Care Occupations; Curriculum; Drafters; Electrical Occupations; Electronic Technicians; Evaluation Criteria; Evaluation Methods; Food Service Occupations; Grade 9; *Health Occupations; Job Skills; Learning Activities; *Mechanics (Process); Metal Working; Needle Trades; Objectives; *Occupational Clusters; Occupational Home Economics; Paraprofessional Personnel; Plumbing; Refrigeration Mechanics; Secondary Education; *Service Occupations; Skilled Occupations; *Technical Occupations; Welding

ABSTRACT

This second of two parts presents learning activities for four occupational clusters of a ninth-grade cluster program. It contains theory and hands-on activities that explore the occupational requirements and working environment of these areas to help students make intelligent decisions of possible career choices based on levels of interest and ability. The necessary mathematics, applied science, and English are included as related subject areas. The four occupational clusters and (at least) six basic occupational areas within each occupational field included here are (1) health occupations (child care assistant, medical assistant, dental assistant, nurse, hospital technician, therapist/inhalation/occupational/physical), (2) mechanical occupations (air conditioning and refrigeration, plastics worker, automotive trades worker, plumber/heating worker, mechanical electrical repairer, welder/metal worker), (3) service occupations (beautician, hospitality manager, cook/baker, hotel/motel maintenance worker, dressmaker/fashion designer, upholsterer), and (4) technical occupations (automotive technician, architectural and machine draftsperson, communications technician, electronics technician, computer technician, operating technician). Each cluster lists goals and objectives and then is divided into the occupations. Each occupation section contains a chart listing related learning activities: student activities; tools, equipment, materials; time required; and evaluation. The learning activities follow. (YLB)

ED192007

SCDG 811

CAPE MAY COUNTY VOCATIONAL SCHOOLS

CREST HAVEN RD. CAPE MAY COURT HOUSE, N. J. 08210

PART 2 OF 2

A CAREER GUIDANCE CURRICULUM FOR NINTH GRADE STUDENTS

OCCUPATIONAL CLUSTER LEARNING ACTIVITIES HEALTH - TECHNICAL

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The project reported herein was conducted pursuant to a contract from the New Jersey Department of Education, Division of Vocational Education and Career Preparation. It was funded under Section 133 of Public Law 94-482.

Project Duration: July 16, 1979
Beginning Date

June 30, 1980
Ending Date

The Contractors undertaking this project were encouraged to express fully their judgments in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official funding agency positions or policies.

NINTH GRADE CAREER GUIDANCE PROJECT

CAPE MAY COUNTY VOCATIONAL SCHOOLS

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CAPE MAY COUNTY VOCATIONAL SCHOOLS
Crest Haven Road, Cape May Court House, NJ 08210

HEALTH OCCUPATIONS - COURSE DESCRIPTION

The cluster program is open to ninth grade students for approximately nine weeks and to tenth grade students for one year on a half-day shared-time basis. The students will spend a half-day at the Career Center and a half-day at the home school. The ninth grade student will explore four different occupational clusters before selecting a pre-vocational cluster for further study in the tenth grade. Upon completion of the program, the tenth grade student may enter one of the applicable vocational shops or cooperative programs in the Cape May County Vocational Schools.

The general purpose of both ninth and tenth grade programs is to introduce the students to at least six basic occupational areas within the health occupations field for career awareness and development of practical occupational skills. The occupations explored will be: child care assistant, medical assistant, dental assistant, nurse, hospital technician, and therapist/inhalation/occupational/physical. Theory and "hands-on" activities are combined to explore the occupational requirements and working environment of these areas in order to help the student make intelligent decisions of possible career choices based on levels of interest and ability. Included will be the necessary mathemetics, applied science, and English as related subject areas.

HEALTH OCCUPATIONS - GOALS and OBJECTIVES

1. GOAL: To explore the students' own interests, abilities, and needs in each of the six occupational areas of health occupations to determine their own potential and to make a better career choice in the health field.

   OBJECTIVE: Students will be able to identify the variety of health careers available.

   OBJECTIVE: Students will explore job opportunities, working conditions, locations, financial gains, job security, and training period in each occupational classification which would be personally satisfying.

   OBJECTIVE: Students will receive training in the general skills of employment-seeking including resumes, interviews, and job descriptions.

   OBJECTIVE: Students will experience "hands-on" activities in each of the health career areas.

2. GOAL: To develop the general skills necessary for successful performance in the health field.

   OBJECTIVE: Students will be able to recognize and properly utilize the various tools, materials, and equipment appropriate to each occupational classification.

   OBJECTIVE: Students will be able to describe and perform some of the skills necessary for job entry in each occupational classification.

   OBJECTIVE: Students will be able to identify, spell, define, and use basic trade terminology and related information used in each occupational classification.

   OBJECTIVE: Students will learn, demonstrate, and practice the shop safety and practices unique to each occupational classification.

   OBJECTIVE: Students will be able to perform basic operations of addition, subtraction, multiplication, and division of whole numbers, fractions, decimals, and percentages applicable to each occupational classification.

   OBJECTIVE: Students will be able to use both English and metric measurements as applicable to each occupational classification.

3. GOAL: To provide specialized and individual kinds of educational experiences necessary to meet the needs of each student.

   OBJECTIVE: Students will have the opportunity to work independently on individual carrel projects.

   OBJECTIVE: Students will have the opportunity to work at a variety of work stations.

   OBJECTIVE: Ninth grade students will learn to utilize their time on a limited basis to work on projects of their own choosing.

   OBJECTIVE: Tenth grade students will learn to utilize their time on an expanded basis to work on projects of their own choosing.

   OBJECTIVE: Tenth grade students will choose a specific occupational area in line with their interest and/or special abilities to explore more completely.

   OBJECTIVE: In line with their abilities, students will learn to efficiently manage working time allotted in the shop to meet assigned project deadlines for both individual and group projects.

4. GOAL: To provide significant opportunities consistent with the age of the student and to help determine the nature of educational experiences of the student.

   OBJECTIVE: Students will experience basic applied science and other theory as well as "hands-on" applications in each of the occupational classifications.

   OBJECTIVE: The ninth grade student will be able to explore various health occupations during a nine-week period.

   OBJECTIVE: The tenth grade student will be able to understand, acquire, maintain, and progress in skills and competencies essential to health occupations during a one-year period.

5. GOAL: To increase the students' self-awareness and self-understanding.

   OBJECTIVE: Students will explore their vocational and avocational interests and abilities.

   OBJECTIVE: Students will begin to build an awareness of "where I am" compared to "where I want to be."

   OBJECTIVE: Students will begin to relate awareness and attitudes to specific or related occupational clusters.

OBJECTIVE: Ninth grade students will select an occupational cluster for in-depth analysis.

OBJECTIVE: Tenth grade students will choose a tentative career in which they can pursue vocational training.

6. GOAL: To help students learn to enjoy the process of learning and to acquire the skills necessary for a lifetime of continuous learning.

OBJECTIVE: Students will be encouraged to develop an appreciation of and pride in the value of work and the completion of tasks.

OBJECTIVE: Students will be helped to develop confidence in their own abilities.

OBJECTIVE: Students will demonstrate their willingness to learn through good attendance, punctuality, and traits essential to success on the job.

OBJECTIVE: Students will become familiar with the Media Center and learn to use its resources both in carrels and in the Media Center.

7. GOAL: To provide an environment in which competition among students is positive.

OBJECTIVE: The program will provide recognition for student achievement through the publication of an honor roll.

OBJECTIVE: Students will be able to monitor their daily progress through use of progress charts.

OBJECTIVE Students will have opportunities to work cooperatively with other students.

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Child Care Assistant

LESSON OBJECTIVE Students will be able to properly bath an infant.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Bathing an infant 1. Equipment 2. Technique	1. Have students assemble needed equipment 2. Fill basin with water 3. Undress infant 4. Test water temperature 5. Place infant in water 6. Wash infant 7. Remove infant from water 8. Dry infant 9. Dress infant 10. Put equipment away	Basin Infant mannequin Water Towel Wash cloth Soap Diapers T-Shirt Receiving blanket Table	30 Minutes	Observation

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Child Care Assistant

LESSON OBJECTIVE The students will be able to design a day care facility.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Day Care Design	1. Give students paper and play dough 2. Cover desks with paper 3. Take colored play dough and design Play Room 4. Use color schemes suitable for area 5. Place on cardboard 6. Clean-up	Paper Play Dough Newspapers Cardboard	1 Hour	Observation

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Medical Assisting

LESSON OBJECTIVE The students will be able to: 1. Identify basic instruments used in a physical examination.

2. Position patients for six basic examinations.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Using actual instruments or cut-out pictures, discuss the uses of these instruments. a. Stethoscope b. Percussion hammer c. Otoscope d. Opthalmoscope e. Tongue depressor f. Tape measure 2. Discuss and demonstrate the 6 positions and how to drape the patient. a. Dorsal recumbent b. Knee-chest c. Prone d. Sims e. Semi-Fowlers f. Dorsal lithotomy	1. Have the students make drill cards of the basic instruments for examination. 2. Role play using the instruments discussed. Students can look into each others ears, and throat, listen to heart and lungs, test reflex, and take blood pressure. 3. Have each student position another student in all six positions. 4. Give each student 3 situations and have them tell and demonstrate what position would be used.	1. Stethoscope 2. Percussion hammer 3. Tongue blade 4. B/P cuff 5. Otoscope 6. Opthalmoscope 7. Sheet 8. Examining table or floor mat	2 ½ Hours	Observation Oral identification of instruments.

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Medical Assistant

LESSON OBJECTIVE The student will be able to identify the duties of a Medical Assistant

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Define Medical Assistant duties. a. Clinical b. Administrative c. Personal assets needed d. Job possibilities e. Educational requirements f. Courses studied in a Medical Assisting program 2. Have a speaker come and speak to class on Medical Assisting.	1. Brainstorming, have the students think about their own experiences at a doctor's office and give as many duties as possible. 2. Have students work in groups on posters showing the duties of a Medical Assistant. 3. Have students check local newspapers want-ads for Medical Assistant positions. 4. Role play: Physician, Medical Assistant, patients. Arrange the desks and chairs to resemble a waiting room and examining room.	1. Pencils 2. Poster board 3. Paste 4. Magazines 5. Newspapers (Sunday)	3 Hours	Observation Quiz Poster

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Medical Assisting

LESSON OBJECTIVE The student will be able to: (1) Identify three types of thermometers (2) Describe three methods of taking a temperture (3) Read and record the temperature reading on thermometer

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Discuss and demonstrate the three types of thermometers: oral, rectal, and security. Discuss the difference between the three. Three methods: a. Oral-by mouth, leave in place 3-5 min. Most often used. Normal temp. 98.6°F b. Rectal-anus, leave in place 5 min. Most accurate, normal temp. 99.6°F c. Axillary-under armpit, leave in place 10 minutes, least accurate. Normal temp. 97.6°F	1. Have students examine and identify the 3 types of thermometers 2. Have students take and record a temperature on three other students 3. Give a worksheet or use role play: Give the students five different situations and have them tell what method would by best to use	Oral thermometer Rectal thermometer Security thermometer Alcohol Cotton or guaze Paper, pencil	Demonstration 1 Hour Student Activity 1 Hour	Observation Worksheet

PROJECT 1

QUESTIONS

1. Name the 3 types of fever thermometers.

2. Give 3 methods for taking a temperature.

3. What are the advantages of using an electronic thermometer?

4. A normal reading for an oral thermometer is: (a) 98.6° (b) 99.6°F (c) 97.6°F

5. If you were taking a rectal temperature what would the normal reading be?

6. What is the normal reading when taking an axillary temperature?

7. Describe in detail how you would take an oral temperture.

8. What method would you use for an infant? Why?

9. How long must you leave a thermometer in place to take an axillary temperature?

10. Which method is:
    a. Most accurate-
    b. Least accurate-
    c. Most often used-

HOW TO READ A THERMOMETER

DIRECTIONS: Read the following information. Copy the the section outlined in your notebook.

The clinical Medical Assistant has a large number of duties in the doctors office. One of which is taking, reading, and recording a temperature. Below are the types of thermometers and methods of taking a temperature.

I. Thermometers

A. Oral - by mouth
1. long narrow tip
2. taken under the tongue
3. left in place for 3-5 minutes
4. most often used
5. normal reading 98.6°

B. Rectal - by rectum
1. short stubby tip
2. the rectal thermometer should be lubricated with vasoline or lubricating jelly and inserted 1-1½ inches into the rectum
3. hold thermometer in place
4. leave in place 5 minutes
5. most accurate method
6. used alot for infants
7. normal reading 99.6°

C. Axillary or groin
1. use rectal or security tip thermometer
2. axillary means armpit so the thermometer is placed under the arm
3. left in place 10 minutes
4. least accurate method
5. can be used for children or patients that are uncontious or unable to open their mouth
6. normal reading 97.6°

D. Electronic thermometers
1. very quick reading - usually in 5 seconds
2. accurate
3. more sanitary

COPY THE FOLLOWING GENERAL RULES IN YOUR NOTEBOOK ALSO

General rules for taking a temperature:

1. Rinse thermometer well with cold water.
2. Check water temperature with your fingers before putting thermometer under water.
3. Shake down below 95°
4. To shake down hold top end between thumb and first finger and swing wrist down with a snap, as though you were shaking water off of your fingers.

5. DO NOT SHAKE THERMOMETER NEAR SOLID ITEM.
6. Wipe saliva off thermometer.
7. Do not touch tip.
8. Hold the thermometer at eye level with your right hand, so the calibrated scale is toward you. Rotate it slightly back and forth between the thumb and finger until mercury can be seen.
9. Read and record temperature.
10. Wash thermometer with water and soap. Soak in disinfectant.

DIRECTIONS: Answer the following questions from the notes given. Write questions and answers on a seperate piece of paper and give to instructor.

1. Name the 3 types of fever thermometers.

2. Give 3 methods of taking a termperature.

3. What are the advantages of using an electronic thermometer?

4. A normal reading for an oral thermometer is:

   a. 98.6° b. 99.6° c. 97.6°

5. If you were taking a rectal temperature what would be the normal reading?

6. What is the normal reading when taking an axillary?

7. Describe in detail how you would take an oral temperature.

8. What method would you use for an infant? Why?

9. How long must you leave an axillary temperature in place?

10. Which method is, a. most accurate b. least accurate c. most often used?

Take an oral temperature on 3 other students and record the readings along with the students name, and give it to the instructor. Be sure to put the project number and your name on all your work.

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Dental Assisting

LESSON OBJECTIVE The students will be able to use correct handwashing techniques.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Handwashing Techniques	1. Roll-up sleeves. 2. Turn on and adjust water to a comfortable temperature. 3. Wet hands and apply a generous amount of soap. 4. Work into a lather, rinse and apply more soap. 5. Wash palms using a friction motion. 6. Wash backs of hands using the same motion. 7. Wash thumbs. 8. Wash between fingers. 9. Cup hands to create a suction. 10 Rinse above wrists, allow water to run off tips. 11. Dry thoroughly	1. Sink or basin 2. Running water 3. Soap 4. Towel	15 Minutes	Observation Student participation

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Dental Assisting

LESSON OBJECTIVE The student will be able to name each tooth and it's surfaces

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. General mouth anatomy 2. Discuss and demonstrate the names of the teeth and their shape. a. Central incisors-4 cutting teeth b. Lateral incisors-4 cutting teeth c. Cuspids-4 spear shaped d. Premolar or bicuspid-8 crushing teeth e. Molars-12 grinding teeth 3. Surfaces of teeth a. Mesial b. Distal c. Labial d. Lingual e. Buccal f. Occlusial g. Incisal edge	1. Give students a mirror to see the shape and location of their teeth while you are discussing tooth location. 2. Have students draw and label the teeth. 3. Have the students bring in a bar of soap so they can carve a tooth from the soap. 4. Students can either draw or cut out pictures of teeth to use as flash cards.	1. Poster board 2. Pencil 3. Scissors 4. Markers 5. Mirrors 6. Knives 7. Paper towels or newspapers	3 Hours	Observation Finished projects

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Dental Assisting

LESSON OBJECTIVE The students will be able to: 1. brush their teeth properly 2. choose the correct tooth brush 3. floss properly 4. identify the chain of tooth decay.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP , MAT.	TIME REQ.	EVALUATION
Discuss and Demonstrate: 1. Proper method for brushing 2. Which toothbrushes are best 3. Types of dental floss and how to use it 4. Chain of tooth decay and how to break it 5. Foods and snacks that won't harm your teeth	1. Have students bring from home a toothbrush and toothpaste. Give each student a disclosing tablet and have them practice brushing. 2. Give each student 12 in of dental floss and have them practice using it. 3. Have students make preventive dentistry posters. 4. Have students pair-up and role play teaching preventive dentistry to a patient.	Water Sink or basin Dental floss Disclosing tablets Poster board Pencil	4 Hours	Observation Demonstration Posters Class participation

OCCUPATIONAL CLUSTER Health Occupations (Page 1) CLUSTER OBJECTIVE NUMBER

OCCUPATION Nursing

LESSON OBJECTIVE Students will be able to obtain and read blood pressures with understanding.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Blood Pressure 1. Equipment a. Sphygmomanometer b. Stethoscope 2. Safety 3. Vocabulary a. Systolic b. Diastolic c. Circulation 4. Technique	1-a. Observe the range of numbers and be able to realize representation of each line. 1-b. Obtain stethoscope and show the aseptic technique 3-a. Maximum pressure against artery 3-b. Minimum pressure against artery 3-c. Observe the heart and how it functions 4-a. Place student in comfortable postion. b. Place forearms on table palms up. c. Place self in comfortable position. d. Place cuff with inflatable bag over brachial artery. e. Wrap cuff around arm smoothly. f. With fingertips, feel for pulse. Place stethoscope. g. Pump bulb to 160 mm h. Gradually release evenly until pumping sound is heard.	Sphygomanometer Stethoscope Cotton balls Alcohol Transparencies Blackboard, chalk Heart Model	1. 1 Hour 3. 2 Hours	Demonstrate Lecture

OCCUPATIONAL CLUSTER Health Occupations (Page 2) CLUSTER OBJECTIVE NUMBER

OCCUPATION Nursing

LESSON OBJECTIVE Students will be able to obtain and read blood pressure with understanding.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
5. Variations	Take blood pressure: 1. Standing 2. Sitting 3. Lying down on mat or bed 4. After riding bike for 5 minutes Give average of blood pressure and compare students.	Mat or bed Bicycle	3 Hours	Observation

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Nursing

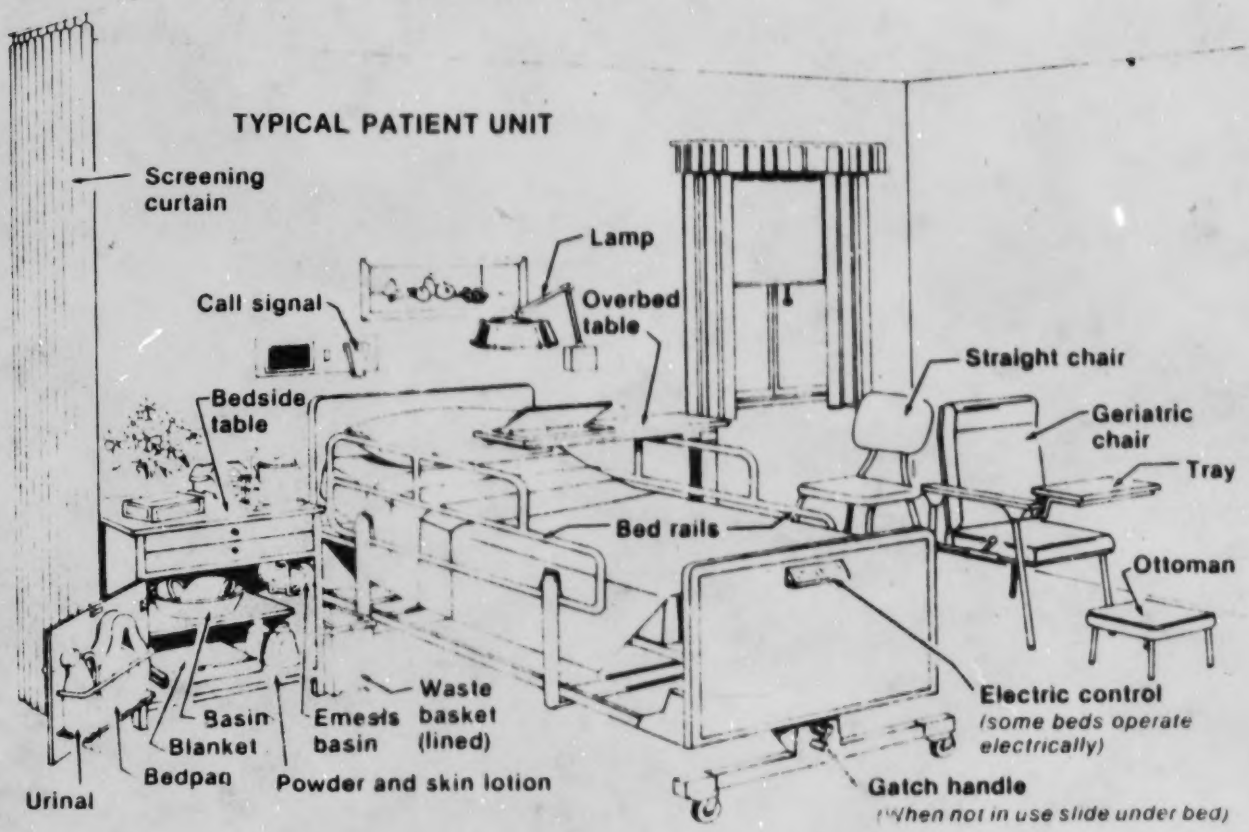
LESSON OBJECTIVE Students will be able to know purpose and function of each part of a hospital unit.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Hospital Unit 1. Parts 2. Safety	1. Name each part of a unit 2. Spell and describe function of each 3. Find each part in the unit 4. Observe electrical parts of each unit 5. Danger of water 6. Aseptic techniques 7. Draw a picture of 15 parts of a unit and label each.	Overhead Bed Call bell Overhead table Basin Emesis basin Bedpan Fracture pan Water pitcher Urinal Soap dish Film: Day in Life of a Nurse in the Hospital	1-3 2 Hours 4-6 30 Minutes 7 30 Minutes	Observation Testing

OBJECTIVES: WHAT YOU WILL LEARN

When you have completed this section you should be able:

- To describe the patient's unit
- To check the unit
- To define disposable equipment
- To list the equipment contained in the unit
- To identify and describe the purpose of each piece of large equipment



OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Surgical Technician (Hospital)

LESSON OBJECTIVE 1. To have students understand definition of "Surgical Technician."

2. To have students understand duties performed by a "Surgical Technician."

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Surgical Technician 1. Definition 2. Duties	1. Prepare patients 2. Transporting 3. Drape and position patients 4. Obtain materials 5. Pass instruments 6. Operate equipment 7. Clerical 8. Clean and stock rooms	Blackboard and chalk Pictures Filmstrip: Surgical Technicians	30 Minutes 10 Minutes	Lecture and discussion
3. Equipment a. Clothing	1. Describe dress of O.R. technician and purpose 2. Draw or find pictures of O.R. technician and show duties.	Paper and pencil Magazine	1 Hour	Observation
4. Instruments a. Basic set	1. Name basic instruments in an O.R. set 2. Identify each and place on mayo stand. 3. Give handout sheet and label instruments drawn on paper	Needle holder Straight and curved Kelly Scissors	1 Hour 30 Minutes	Observation Testing

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OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Medical Lab Technician (Hospital)

LESSON OBJECTIVE Students will learn correct procedure of collecting a urine specimen.

Students will perform routine urinalysis.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Obtaining a urine specimen	1. Wash hands 2. Go to bathroom, urinate into cup. (Stress upon female to wipe front to back) 3. Cover specimen and bring back to class 4. Wash hands	Urine container Bathroom Paper towels	20 Minutes	Observation
Testing urine specimen 1. Properties 2. Normals	1. Take urine specimen and place litmus paper in specimen 2. Wait 30 seconds 3. Read and compare with color chart 4. Compare results with classmates	Litmus paper Urine specimen Color chart	1 Hour	Observation
		Film: Urine Specimen	30 Minutes	Discussion
		Field trip to Malloy's Laboratory	2½ Hours	Discussion

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Inhalation Therapy

LESSON OBJECTIVE Students will be able to define inhalation, to assemble and use spirometer, and measure vital capacity.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Spirometer 1. Uses 2. Purposes of	1. Take 2 deep breaths and exhale as much as possible 2. Take another deep breath and blow continuously into spirometer and watch measurement of mm of Hg. for capacity 3. Take graphic sheets compare height and mm to find % 4. Each student then compares with each other. 5. Attach a straw to a balloon and measure difference between smokers and non-smokers	Spirometer Balloons Straws Rubber bands Chart, pencil, paper Picture of autopsied smoker's lung and non-smoker's lung. Films: Emphysema, the Facts Huffless, Puffless Dragon	1-2 1 Hour 3-4 1 Hour Films-approximately ½ hour ea.	Observation Check Charts

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Inhalation Therapy

LESSON OBJECTIVE Students will be able to: a. describe parts of an oxygen tent b. assemble and place patient in tent c. drape patient.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Oxygen tent a. Safety 1. Combustability 2. Danger of plastic 3. Articles carrying cumbustability b. Uses c. Position of patient and draping	a-1. Show matches will only blow out with CO_2 a-2. Take plastic bags and press against face. a-3. Name personal article and hospital articles that support combustion. c-1. Check potency of plastic c-2. Flush oxygen tent for 5 minutes c-3. Put patient in semi-fowlers position c-4. Place tent over patient c-5 Place towel over patient's head. c-6. Tuck in all parts c-7. Cover bottom c-8 Close all zippers c-9. Check patient's comfort	Matches Plastic bags Ozygen tent Bed Draw sheet Towel Hand bell	a- 30 minutes c- 3 Hours	Demonstration Observation

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Occupational Therapy

LESSON OBJECTIVE 1. Students will be able to define A.D.L. 2. Students will experience frustrations of a rehabilitation patient.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Activities of daily living 1. Definition 2. Dexterity	1. Name all the normal activities done from moment awaking till going to bed. 2. Each student will place strong arm in sling and perform A.D.L. with opposite hand: a. Brush teeth b. Comb hair c. Girls put on make-up, men shave mannequin d. Untie shoes and replace e. Wash hands f. Go to bathroom 3. Each student will write down reactions to activity.	Blackboard, chalk Toothbrush Comb Make-up Shoes Socks	1. 30 Minutes 2. 6 Hours	Class participation Lecture Observation Discussion

OCCUPATIONAL CLUSTER Health Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Physical Therapy

LESSON OBJECTIVE Students will learn purpose, safety and use of crutches.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Crutch Walking 1. Gaits a. 2 point b. 3 point c. 4 point d. Swing through 2. Adjustments 3. Safety	1. Student will name times each gait is used after demonstration of each. 2. Lie down on bed, and measure from arm pit to heel for length of crutches and adjust. 3. Safety a. Check adjustments b. Check rubber protectors c. Wear shoes Each student will perform 4 gaits and define each. Hand out quiz with drawing of gaits and identify.	Crutches Blackboard and chalk Measuring tape Arm rubbers Hand rubbers Bottom rubbers	45 Minutes 1 Hour 10 Minutes 1 Hour	Lecture Class participation Demonstration Observation Testing

CAPE MAY COUNTY VOCATIONAL SCHOOLS
Crest Haven Road, Cape May Court House, NJ 08210

MECHANICAL OCCUPATIONS - COURSE DESCRIPTION

The cluster program is open to ninth grade students for approximately nine weeks and to tenth grade students for one year on a half-day shared-time basis. The student will spend a half-day at the Career Center and a half-day at the home school. The ninth grade student will explore four different occupational clusters before selecting a pre-vocational cluster for further study in the tenth grade. Upon completion of the program, the tenth grade student may enter one of the applicable vocational shops or cooperative programs in the Cape May County Vocational Schools.

The general purpose of both ninth and tenth grade programs is to introduce the students to at least six basic occupational areas within the mechanical occupations field for career awareness and development of practical occupational skills. The occupations explored will be: air conditioning and refrigeration, plastics worker, automotive trades worker, plumber/heating worker, mechanical electrical repair, and welder/metal worker. Theory and "hands-on" activities are combined to explore the occupational requirements and working environment of these areas in order to help the student make intelligent decisions of possible career choices based on levels of interest and ability. Included will be the necessary mathematics, applied science, and English as related subject areas.

MECHANICAL OCCUPATIONS - GOALS and OBJECTIVES

1. GOAL: To explore the students' own interests, abilities, and needs in each of the six occupational areas of mechanical occupations to determine their own potential and to make a better career choice in the mechanical field.

   OBJECTIVE: Students will be able to identify the variety of mechanical careers available.

   OBJECTIVE: Students will explore job opportunities, working conditions, locations, financial gains, job security, and training period in each occupational classification which would be personally satisfying.

   OBJECTIVE: Students will receive training in the general skills of employment-seeking including resumes, interviews, and job descriptions.

   OBJECTIVE: Students will experience "hands-on" activities in each of the mechanical career areas.

2. GOAL: To develop the general skills necessary for successful performance in the mechanical field.

   OBJECTIVE: Students will be able to recognize and properly utilize the various tools, materials, and equipment appropriate to each occupational classification.

   OBJECTIVE: Students will be able to describe and perform some of the skills necessary for job entry in each occupational classification.

   OBJECTIVE: Students will be able to identify, spell, define, and use basic trade terminology and related information used in each occupational classification.

   OBJECTIVE: Students will learn, demonstrate, and practice the shop safety and practices unique to each occupational classification.

   OBJECTIVE: Students will be able to perform basic operations of addition, subtraction, multiplication, and division of whole numbers, fractions, decimals and percentages applicable to each occupational classification.

   OBJECTIVE: Students will be able to use both English and metric measurements as applicable to each occupational classification.

3. GOAL: To provide specialized and individual kinds of educational experiences necessary to meet the needs of each student.

   OBJECTIVE: Students will have the opportunity to work independently on individual carrel projects.

   OBJECTIVE: Students will have the opportunity to work at a variety of work stations.

   OBJECTIVE: Ninth grade students will learn to utilize their time on a limited basis to work on projects of their own choosing.

   OBJECTIVE: Tenth grade students will learn to utilize their time on an expanded basis to work on projects of their own choosing.

   OBJECTIVE: Tenth grade students will choose a specific occupational area in line with their interest and/or special abilities to explore more completely.

   OBJECTIVE: In line with their abilities, students will learn to efficiently manage working time allotted in the shop to meet assigned project deadlines for both individual and group projects.

4. GOAL: To provide significant opportunities consistent with the age of the student and to help determine the nature of educational experiences of the student.

   OBJECTIVE: Students will experience basic applied science and other theory as well as "hands-on" applications in each of the occupational classifications.

   OBJECTIVE: The ninth grade student will be able to explore various mechanical occupations during a nine-week period.

   OBJECTIVE: The tenth grade student will be able to understand, acquire, maintain, and progress in skills and competencies essential to mechanical occupations during a one-year period.

5. GOAL: To increase the students' self-awareness and self-understanding.

   OBJECTIVE: Students will explore their vocational and avocational interests and abilities.

   OBJECTIVE: Students will begin to build an awareness of "where I am" compared to "where I want to be."

   OBJECTIVE: Students will begin to relate awareness and attitudes to specific or related occupational clusters.

OBJECTIVE: Ninth grade students will select an occupational cluster for in-depth analysis.

OBJECTIVE: Tenth grade students will choose a tentative career in which they can pursue vocational training.

6. GOAL: To help students learn to enjoy the process of learning and to acquire the skills necessary for a lifetime of continuous learning.

OBJECTIVE: Students will be encouraged to develop an appreciation of and pride in the value of work and the completion of tasks.

OBJECTIVE: Students will be helped to develop confidence in their own abilities.

OBJECTIVE: Students will demonstrate their willingness to learn through good attendance, punctuality, and traits essential to success on the job.

OBJECTIVE: Students will become familiar with the Media Center and learn to use its resources both in carrels and in the Media Center.

7. GOAL: To provide an environment in which competition among students is positive.

OBJECTIVE: The program will provide recognition for student achievement through the publication of an honor roll.

OBJECTIVE: Students will be able to monitor their daily progress through use of progress charts.

OBJECTIVE: Students will have opportunities to work cooperatively with other students.

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Common to All

LESSON OBJECTIVE Students will become aware of their own interests. "Self Awareness"

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
General Interest	Complete Prepared Forms	Pencil/Paper	30 Minutes	Non-Graded
Surveys	Complete Forms with Instructor	Forms		Review by both teachers
	Discussion of Items			File in Personal Folder

STUDENT: _____

DATE: _____ 102-A

GENERAL INTEREST SURVEY

DIRECTIONS: After each item put a check or an "X" in the appropriate column.

Do I prefer:	VERY LITTLE APPEAL	SOMEWHAT APPEALING	VERY MUCH APPEAL
1. To work with things - jobs that require manual skills.			
2. To work with ideas - jobs that require one's intellect to solve problems.			
3. To help people - assist people in a helping relationship.			
4. To work with people - jobs that generally require a pleasing personality and ability to get along with others.			
5. To produce a tangible product - to be able to see the physical results of work.			
6. The opportunity to use my own ideas - ie., self-expression.			
7. To work independently - requiring self-discipline and initiative.			
8. To work as part of a team - cooperating with others in the performance of one's job.			
9. To work outdoors - exposed to weather conditions.			
10. To work indoors			

	VERY LITTLE APPEAL	SOMEWHAT APPEALING	VERY MUCH APPEAL
11. To travel frequently in the performance of one's job.			
12. To be confined to one work area - physically situated at one area.			
13. To judge the quality of others' work - ie., quality control.			
14. To use arithmetic - ie., to work with numbers.			
15. To work with children.			
16. To sell things - convincing others to buy a certain product.			
17. To work with money - managing other people's money.			
18. To assist people who are ill and cannot care for themselves.			
19. To do work which requires physical stamina - ie., heavy lifting, operating heavy equipment.			
20. To have the opportunity to work different shifts or overtime.			

DIRECTIONS: Please put in order of importance those job characteristics which are most appealing to you.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

OCCUPATIONAL RESEARCH GUIDE

1. Name of occupation:

2. Description of job duties:

   a.
   b.
   c.
   d.
   e.
   f.
   g.

3. Education/training required:

   a. What skills are necessary?

   b. What high school courses would be helpful in preparing for this job?

   c. Where or how can you receive the necessary training for this job?

4. Which interest, aptitudes, and personality traits are appropriate for this job?

5. Is there now a demand for workers in the occupation? YES NO

6. Will there be a demand in the future? YES NO

7. How might one advance in this occupation?

8. What kind of training and/or experience is necessary for promotion?

9. Most workers in this career are found in (circle one or more):

   cities rural areas all areas offices factories other

10. Possibilities for promotion are _____.
    (GOOD) (FAIR) (POOR)

11. The earnings I can make in this career are _____.
    (SATISFACTORY) (UNSATISFACTORY)

12. I _____ discussed my plans with someone already in this career.
    (HAVE) (HAVE NOT)

13. Steps and courses needed to prepare myself for this career:

    1. _____

    2. _____

    3. _____

    4. _____

14. I _____ considered the financial requirements for further
    (HAVE) (HAVE NOT)
    education/training in this career. I will either meet these requirements on my own resources or will apply for financial aid at the institution where I plan to attend.

15. I plan to seek further education/training at one of the below-named institutions:

    a. _____
    (NAME OF INSTITUTION) (ADDRESS)

    b. _____
    (NAME OF INSTITUTION) (ADDRESS)

    c. _____
    (NAME OF INSTITUTION) (ADDRESS)

    d. _____
    (NAME OF INSTITUTION) (ADDRESS)

WHERE I IS / AM / ARE IN CAREER PLANNING

		YES	NO
1.	Spent time thinking about myself and my future education and work	____	____
2.	Talked with other students about myself and careers	____	____
3.	Talked with my parents about what I might do	____	____
4.	Examined literature from schools and colleges about their programs	____	____
5.	Read pamphlets or books about occupations	____	____
6.	Sent for literature about educational programs or occupations	____	____
7.	Read career materials from a library	____	____
8.	Watched TV programs about occupations	____	____
9.	Talked with family or friends about their careers	____	____
10.	Talked with a guidance counselor about what I might do	____	____
11.	Visited vocational schools or colleges	____	____
12.	Visited exhibits which give information about careers	____	____
13.	Visited places of employment to learn about kinds of work done there	____	____
14.	Talked with teachers about occupations	____	____
15.	Other things I have done		
16.	_____		
17.	_____		
18.	_____		
19.	_____		
20.	_____		

CAREER TRIAL PLAN

Tentative Career Selection: _____

Note: The following checkout will provide a means for you to do some reality testing of your career choice. Please give careful thought to your responses so that your chances of success can be predicted.

PLEASE CHECK	COMMENTS (underline one)
( ) 1. I have considered the mental abilities and aptitudes needed for this career (such as scholastic ability, clerical, mathematical, verbal, science, or mechanical aptitude.)	I can meet them I cannot meet them Not sure
( ) 2. I have considered the educational/ training requirements for this career (such as length of training, courses required, nature of education/training, aptitude strength, etc.)	I can meet them I cannot meet them Not sure
( ) 3. I have considered my interests and personality needs (such as interest in ideas, people, things, outdoor, artistic, investigative, mechanical things, etc.)	My interests and personality needs are in the following areas:
( ) 4. The physical requirements, the physical surroundings, and working conditions of this career have been investigated.	They appear to be: Satisfactory Unsatisfactory
( ) 5. I have carefully considered the advantages and disadvantages of this career. The advantages outweigh the disadvantages.	YES NO
( ) 6. I can tolerate the disadvantages.	YES NO
( ) 7. I have investigated the job outlook in this career for the next 10 years.	The outlook is: Excellent - Good - Fair - Poor
( ) 8. The activities of this career seem to be in harmony with my value system and life style.	YES NO
( ) 9. I have investigated the probable geographic area in which employment will be available in this career.	I am - I am not willing to leave the area

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Common to All

LESSON OBJECTIVE To teach students to work safely in school and outside of school in a chosen occupation.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Working Safely 1. Safety equipment available 2. Right tool/Right Task 3. Method of Use 4. Tool Condition	Selected Student Demonstration Before/ After film Show six (6) Filmstrips Cornet Series 614.8	Screwdriver Hammer/Punch Electric Drill Grinder Hacksaw Film Handout: Safety: List three mistakes made by students making the demonstration.	30 Minutes 2 Filmstrips each day three days	Attendance 1 Observation or Work habits

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Common to All

LESSON OBJECTIVE To make students aware of tool names. To make students aware of tool value, and to teach tool control.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Checkout 1 Check in tools from cabinets	Issue tools to other students Insure their return Maintain orderly cabinet and clean safe tools	Cabinets: 1. Mech/Electrical 2. Air Conditioning 3. Metal/Welding 4. Automotive 5. Plumbing/Heating One student all cabinets	One student each day in rotation	1. Review of issue sheet 2. Observation of student 3. Observation of cabinet

MECHANICAL OCCUPATIONS

TOOL ISSUE ASSIGNMENT

You are responsible for the issue/return of the tools in the_____Tool crib.

Record your issues below and put a line next to the name when the tool is returned.

_____
(STUDENT NAME)

_____
(HOME SCHOOL)

NAME OF PERSON RECEIVING TOOL	DESCRIPTION OF TOOL	CONDITION OF TOOL UPON RETURN

PLEASE REMEMBER --- YOU ARE RESPONSIBLE

Turn this tool record into the Instructor when the crib is locked prior to your leaving for the day.

_____

REMARKS AND SIGNATURE OF INSTRUCTOR

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Common to All

LESSON OBJECTIVE To Create "Self Awareness" in dealing with people. Do you want to meet directly with the customer in your selected occupation?

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Customer Relations 1. Dress 2. Your work habits 3. Customer habits 4. Promptness 5. Ability to take criticism 6. Desire to handle money 7. Travel 8. Account for time.	Selected student to assist in role playing Record feelings on handout	Small appliance to center attention	15-30 Minutes	Non-Graded teacher evaluation

MECHANICAL OCCUPATIONS

"CUSTOMER RELATIONS"

(DATE) _____ (NAME) _____

You have watched or played a "role" in our "customer relations" program. you must be aware of your own feelings and desire about the direct dealings with people as you select a career. For example, if you choose to become an "Appliance Repairman" you will work directly with people. If you choose to become an Electrician you would more than likely not deal directly with people.

Take a minute and record your honest responses to the following questions:

1. Would a customer "looking over your shoulder" as you work bother you?_____
   Would they slow you up or make you angry?_____
2. Can you accept direct criticism about your work?_____
3. Does handling money for other people bother you?_____
4. Can you work with someone talking to you?_____
5. Do you stop and talk or continue to work?_____
6. Would you rather work:

   a. Where you directly meet the public
   or
   b. In the back room behind the scenes _____ (WRITE a or b)

_____
Teacher Review

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Trade Worker

LESSON OBJECTIVE Familiarize student with available equipment in the trade. Provide "hands-on" experience working with grease/dirt/cleaning equipment.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Clean auto parts with tank cleaner	1. Take dirty part 2. Clean in tank with brush 3. Rag dry after drawing	Cleaning tank, brush, rags Note: air not available	20 Minutes	Non-graded teacher observation

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Trades Worker

LESSON OBJECTIVE To familiarize students with some of the work involved in the auto trades through "hands-on" experience.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Proper use of battery charger/ D.C. electricity	1. Charge battery 2. Test battery 3. Review by drawing sample auto electrical system	Paper/pencil	30 Minutes	Non-graded

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Trades Worker

LESSON OBJECTIVE Students will understand the operation of the internal combustion engine.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Understand cycles of the internal combustion engine	1. Review of handouts 2. Questions 3. Demonstration of knowledge on small engine 4. View film	1. Handouts 2. Training Aid 4-cycle engine 3. Film - ABC's of Engines	20 Minutes	None UPDATE: 1. Handout Review

HOW A FOUR-CYCLE ENGINE WORKS

1. INTAKE STROKE: Egg-shaped cam on rotating camshaft forces intake valve open. The piston moving down the cylinder draws in fuel-air mixture from the carburetor by atmospheric pressure.

2. COMPRESSION STROKE: Camshaft rotation allows the spring to close the valve. The piston moves back up the cylinder, and compresses the fuel and the air mixture near the top.

3. POWER STROKE: Spark plug ingnites the explosion mixture, and the expanding gases force the piston rapidly down the cylinder, turning the crankshaft, flywheel and camshaft.

4. EXHAUST STROKE: Momentum carries the piston back up the cylinder, forcing the burned gases out through the exhaust valve, which has been opened by the cam.

HOW A TWO-CYCLE ENGINE WORKS

1. On the upward stroke, fuel mixture already in cylinder is compressed. Vacuum formed in airtight crankcase by rising piston draws more mixture from the carburetor and past the reed valve.

2. At top of stroke, pressure stablizes in the crankcase and the reed valve springs shut. The spark plug fires and starts the power (downward) stroke.

3. On downward stroke, power is transmitted to the crankshaft, and the fuel air mixture in the crankcase is compressed by the descending piston.

4. Near the bottom of the stroke, the piston uncovers the ports and the pressurized fuel-air mixture rushes into the cylinder, forcing the burned gases out the exhaust port.

After our discussion go to the carrol containing the training aids for "engine operation". A lawn mower engine is used as an example of the four-cycle engine and a chain-saw engine for the example of a two-cycle engine.

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Auto Trades Worker

LESSON OBJECTIVE To familiarize students with basic automotive systems and the functions they perform

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Review systems of the automobile	During discussion draw various systems. 1. Engine lubrication 2. Cooling 3. Ignition 4. Carburetor 5. Steering 6. Suspension 7. Transmission 8. Drive train 9. Tires 10. Exhaust 11. Body interior 12. Accessories	Paper/pencil List systems: Indicate related jobs and what jobs offer the most interest.	20 Minutes	Graded Hand-in of work

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Trades Worker

LESSON OBJECTIVE Familiarize student with the tire industry.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Research and list passenger car tire sizes	1. List common passenger auto tire sizes 2. Describe size methods 3. Describe common materials used in tire construction Source: Encyclopedia	Paper/Pencil Chalk Board requirement Identification: Materials: Load range: Size: Ex: er-.715 x 15	30 Minutes	Graded report

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Auto Trades Worker

LESSON OBJECTIVE Familiarize student with the lubricating oils used in the auto trades

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Research and list lubricating oils.	1. List common grades and service of oils 2. List common grades of grease 3. Describe ratings and weights	Paper/pencil Chalk board to Describe following: 1. A.P.I. 2. Oil grades and their meanings 3. Service grades "Se" "S.B." 4. Oil contents	30 Minutes	Graded report

OCCUPATIONAL CLUSTER Mechanical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Trades Worker

LESSON OBJECTIVE Students will be familiar with some of the work involved in the auto trade.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Proper use of battery charger/D.C. electricity	1. Charge battery 2. Test battery 3. Review by drawing sample auto electrical system	Drawing of wet cell Record on reverse of hand-out. Name, date, type of charger, time charged, date charged. Record voltage before and after charge.	30 minutes	Non-graded

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Mechanical & Electrical Repairs

LESSON OBJECTIVE Familiarize student with small engine test equipment and the need to use it for efficient repairs.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Test small engine condenser and coil	Each student to test one item	Model #98 Merc-a-tronic tester Used condensers Used ignition coils	120 Minutes	Teacher observation and oral questions

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Mechanical Electrical Technician

LESSON OBJECTIVE Review the basic operations of math as applicable to the occupational classification.

Establish assistance program for those individuals where indicated.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Understand the basic operation or math applicable to trade: a. Addition b. Subtraction c. Division d. Decimals e. Multiplication f. Fractions	1. Complete quiz 2. Verbally provide answers to written board problems 3. Measure journal with micrometers	1. Pencil/Paper 2. Micrometers 3. Crank shaft small engine Handout: Description of Crank shaft parts Math quiz	60 Minutes	Non-Grade Quiz

MATH FOR MECHANICS

GRADED BY _____

MECHANICAL OCCUPATIONS

_____
(Student Name)

_____
(Home School)

Good Mechanics understand and use mathematics. The following is not an examination but a review to let us know what mathematics must be reviewed.

1. Decimal fraction: .3 is written_____
2. Decimal fraction: .02 is written_____
3. Decimal fraction: .003 is written_____
4. Write correctly and add the following fractions: 4.5 plus 158 plus 72.134 equals:
5. Multiplication of decimals: .003 X .02 equals_____
6. Change the following decimal or fraction to percentages:
   a. 5/6 equals_____
   b. .64 equals_____
7. Change the following percent to a decimal: 42.6% equals_____
8. $60.00 is what percent of $180.00?_____
   (Show your work)
9. Substract the following fractions: 3-3/4 from 8 equals_____
10. An automobile odometer reads 43,275 when filled with gasoline. During the day it is driven and refilled with fifteen (15) gallons of fuel. The odometer when filled is 43,580. What is the miles driven per gallon of fuel used?_____
    (Show your work)
11. Optional work with micrometer measurements.

OCCUPATIONAL CLUSTER Mechanical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Mechanical and Electrical Repair

LESSON OBJECTIVE 1. To learn to use solder and soldering iron. 2. To learn the various types or connections with nuts, solder, crimping dies.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Connect wires with solder and wirenuts	1. Study hand-out 2. Perform soldering and use wirenuts Proceed to Carrel #3 for practice	Soldering Iron Wirenuts Solderless terminals 60/40% solder Hand-out	2 Hours	Teacher evaluation

MECHANICAL OCCUPATIONS

WIRE JOINING

The joining of wires to complete an electrical circuit must be done in an approved manner.

SPLICES

Line Splice

Tap Splice

Pigtail Splice

WIRE NUTS

Size:_____

Composition:_____

SOLDERING

Solder: Tin% _____ Lead% _____
Flux: Rosin

SUPPLIES and TOOLS

Iron - Stand - Solder - Pliers (Needle Nose)

Complete work under direct supervision

Grade:_____

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Mechanical/Electrical Repair

LESSON OBJECTIVE Assemble and describe common fasteners and connectors to become aware of types, uses, and related tools.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Assemble and describe common connections and fasteners	Identify, measure, establish use, composition, and tool used with part.	Various bolts, nuts, clips, etc. 1. Thread gage 2. Size gage for bolts 3. 12" Ruler 4. Clamp Pliers 5. Internal/external clip pliers	120 Minutes	Teacher Observation

(Student Name) _____ (Date) _____ 116-A

MECHANICAL OCCUPATIONS
Mechanical/Electrical Repairer

LEARNING ACTIVITY: Assemble, measure and describe common connectors and fasteners.

DIRECTIONS: The will find on a central table an assortment of nuts, bolts, clips, clamps, screws, and other connectors and fasteners used in Mechanical and Electrical Repair work. These will be used in this assignment.

1. Work in teams of two students to a carrel.

2. Start with five (5) different pieces and types and answer the following questions for each piece:

	#1	#2	#3	#4	#5
a. Name:					
b. Size:					
Kind of					
c. Metal:					
d. Tool:					
e. Use:					

3. Obtain the necessary tools from the tool crib to measure and use.

4. When you have completed five identifications discuss with teacher.

5. Identify as many additional pieces of different types as you desire.
IMPROVE YOUR GRADE AND KNOWLEDGE

6. Return tools to the tool crib.

7. Return pieces identified to the "bucket of bolts" container.

8. Turn this completed handout to the teacher prior to deparing for the day.

ADDITIONAL WORK

TEACHERS COMMENTS

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Plumbing/Heating Worker

LESSON OBJECTIVE Learn to cut, thread, and join galvanized pipe

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Cut and thread ridged pipe and join to fitting	Four Student Teams 1. Thread one end 2. Cut pipe to length directed 3. Thread other end 4. Seal thread W/tape 5. Retain for sale at fair	1. Pipe vise 2. Hacksaw, 24 TPI 3. Pipe dies 4. Cutting oil 5. Reamer 6. Pipe wrench 12" Handout	30 Minutes	Observation by teacher

date _____ name 117-A

MECHANICAL OCCUPATIONS

PLUMBING AND HEATING WORKER

We will learn to measure, cut, thread and join galvanized pipe today.

At the same time we are learning we will make for sale Galvanized Nipples.

These short pipes will be sold at the Spring Fair and the money placed in our account for us to purchase more repair parts.

1. What is the standard length of galvanized pipe when purchased from a distributor?_____
2. What are screw-in allowances on 1/2-inch and 3/4-inch pipe?_____
3. Remember to turn the die clockwise and then back off often to remove the chips.
4. Do a neat job ---- you may be the one buying the nipple at the spring fair!

Detailed Instructions

1. Work in teams of four students.
2. Place pipe in vise and thread one end. Use cutting oil...cut threads 3/4-inch...
3. Measure pipe to length directed.. Remember screw-in allowances...
4. Cut pipe.... Remove burrs with reamer or rat-tail file.
5. Place nipple in vise and thread other end...Again put on 3/4 to 1-inch of threads. Each student will do half the threads. Use cutting oil/get a feel of the job.
6. Protect thread with tape.
7. Place nipple in box after teacher has inspected and graded.
8. Make notation on the progress chart.
9. Did you like working on galvanized pipe?_____

_____
(GRADE)

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Plumbing/Heating Worker

LESSON OBJECTIVE Permit student to get "hands-on" experience in joining copper pipe

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Join 1/2" copper pipe with solder joint	1. Cut 6"copper ridgid pipe 2. Sandpaper surface to all be joined 3. Apply thin layer of flux as soon as possible after sanding 4. Twist one turn at full join 5. Heat entire pipe joint even with wide flame 6. Touch W/50/50 solder one point spread	1. Pipe vise 2. 1/2" pipe & fitting 3. Propane torch 4. 50/50 solder 5. Hacksaw 6. Flux 7. Sandpaper 8. Water/rag	60 Minutes	Teacher observation

DATE _____ NAME _____

MECHANICAL OCCUPATIONS

PLUMBING AND HEATING WORKER

We will join copper pipe to a fitting in order to get the "hands-on" feeling or experience in the plumbing and heating field. Copper pipe is the most common pipe used in the industry for water systems.

The following supplies and parts are required:

1. Pipe vise
2. 1/2 or 3/4-inch pipe and fitting. Describe fitting used._____ _____.
3. Propane torch
4. 50/50 solder
5. Hacksaw Blade 24 TPI
6. Flux
7. Sandpaper 120 grit
8. Water and rag
9. Safety glasses

Study the following steps prior to starting your work. Even though the teacher will observe each step it is best to know what you are doing.

REMEMBER----YOU ARE DEALING WITH HEAT-----SOLDER-----FLUX-----THERE IS DANGER!!

* WEAR YOUR SAFETY GLASSES *

1. Cut 6-inch from length of copper ridgid pipe.
2. Sandpaper all surfaces to be joined.
3. Apply a thin layer of flux as soon as possible after sanding.
4. Twist one turn at full joint.
5. Heat entire pipe joint even with a wide flame.
6. Touch with 50/50 solder at one point. It will spread.
7. You can solder in any position. Gravity is not required for the flow of solder.
8. Let joint cool before touching.
9. SAVE THE PIPE AND FITTING. IT WILL BE REUSED.
10. Remember to make notation on the progress chart.

GRADE-TEACHERS COMMENTS

OCCUPATIONAL CLUSTER Mechanical

CLUSTER OBJECTIVE NUMBER P/H-10

OCCUPATION Plumbing/Heating Worker

LESSON OBJECTIVE To familiarize students with PVC (Poly Vinyl Chlorine) Plastic pipe and it's use.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Cut and join PVC pipe	Observe one fitting Connected by teacher and selected students	1. 1/2" PVC Pipe 2. Fitting 3. Hacksaw - 24 TPI 4. Sandpaper (120) 5. Primer 6. Solvent/Cement 7. Brush	30 Minutes	Oral questions

OCCUPATIONAL CLUSTER Mechanical CLUSTER OBJECTIVE NUMBER

OCCUPATION Plumbing/Heating Worker

LESSON OBJECTIVE Permit students indicating ability and interest in P/H to shadow a student at Vo-Tech for one session to become more familiar with occupation.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Observe Vo-Tech class with assigned student	Make arrangement W/principals, teachers Permit student to visit class Issue Reg. pass	None	One session AM/PM	Oral discussion

CAPE MAY COUNTY VOCATIONAL SCHOOLS
Crest Haven Road, Cape May Court House, NJ 08210

SERVICE OCCUPATIONS - COURSE DESCRIPTION

The cluster program is open to ninth grade students for approximately nine weeks and to tenth grade students for one year on a half-day shared-time basis. The student will spend a half-day at the Career Center and a half-day at the home school. The ninth grade student will explore four different occupational clusters before selecting a pre-vocational cluster for further study in the tenth grade. The tenth grade student completing the program may enter into one of the applicable vocational shops or cooperative programs in the Cape May County Vocational Schools.

The general purpose of both ninth and tenth grade programs is to introduce the students to at least six basic occupational areas within the Service Occupations field for career awareness and development of practical occupational skills. The occupations explored will be: beautician, hospitality manager, cook/baker, hotel/motel maintenance worker, dressmaker/fashion designer, and upholsterer. Theory and "hands-on" activities are combined to explore the occupational requirements and working environment of these areas to help the student make intelligent decisions on possible career choices based on levels of interest and ability. Included will be the necessary mathematics, applied science, and English as related subject areas.

SERVICE OCCUPATIONS - GOALS and OBJECTIVES

1. GOAL: To explore the students' own interests, abilities and needs in each of the six occupational areas of Service Occupations to determine their own potential and to make a better career choice in the Service field.

   OBJECTIVE: Students will be able to identify a variety of Service careers available.

   OBJECTIVE: Students will explore job opportunities, working conditions, locations, financial gains, job security, and training period for each occupational classification which would be personally satisifying.

   OBJECTIVE: Students will receive training in the general skills of employment seeking including resumes, interviews, and job descriptions.

   OBJECTIVE: Students will experience "hands-on" activities in each of the Service Occupations career areas.

2. GOAL: To develop the general skills necessary for successful performance in the Service Occupations field.

   OBJECTIVE: Students will be able to recognize and properly utilize various tools, materials, and equipment appropriate to each occupational classification.

   OBJECTIVE: Students will be able to describe and perform some of the skills necessary for job entry in each occupational classification.

   OBJECTIVE: Students will be able to identify, spell, define, and use basic trade terminology and related information used in each occupational classification.

   OBJECTIVE: Students will learn, demonstrate and practice shop safety and safe practices unique to each occupational classification.

   OBJECTIVE: Students will be able to perform basic operations of addition, subtraction, multiplication, and division of whole numbers, fractions, decimals, and percentages applicable to each occupational classification.

   OBJECTIVE: Students will be able to use both English and metric measurements as applicable to each occupational classification.

3. GOAL: To provide specialized and individual kinds of educational experiences necessary to meet the needs of each student.

   OBJECTIVE: Students will have the opportunity to work independently on individual carrel projects.

   OBJECTIVE: Students will have the opportunity to work at a variety of work stations.

   OBJECTIVE: Ninth grade students will learn to utilize their time on a limited basis to work on projects of their own choosing.

   OBJECTIVE: Tenth grade students will learn to utilize their time on an expanded basis to work on projects of their own choosing.

   OBJECTIVE: In line with their abilities, students will learn to efficiently manage working time allotted in the shop to meet assigned project deadlines for both individual and group projects.

4. GOAL: To provide significant opportunities consistent with the age of the student and to help determine the nature of educational experiences of the student.

   OBJECTIVE: Students will experience basic applied science and other theory as well as "hands-on" applications in each of the occupational classifications.

   OBJECTIVE: The ninth grade student will be able to explore various service occupations during a nine week period.

   OBJECTIVE: The tenth grade student will be able to understand, acquire, maintain, and progress in skills and competencies essential to service occupations during a one-year period.

5. GOAL: To increase the students' self-awareness and self-understanding.

   OBJECTIVE: Students will explore their vocational and avocational interests and abilities.

   OBJECTIVE: Students will begin to relate attitudes and awareness to specific or related occupational clusters.

   OBJECTIVE: Ninth grade students will select an occupational cluster for in-depth analysis.

OBJECTIVE: Tenth grade students will choose a tentative career in which they can pursue vocational training.

OBJECTIVE: Students will begin to build an awareness of "where I am" compared to "where I want to be."

6. GOAL: To help students learn to enjoy the process of learning and to acquire the skills necessary for a lifetime of continuous learning.

OBJECTIVE: Students will be encouraged to develope an appreciation of and pride in the value of work and completion of tasks.

OBJECTIVE: Students will be helped to develope confidence in their own abilities.

OBJECTIVE: Students will demonstrate their willingness to learn through good attendance, punctuality, and factors essential to success on the job.

OBJECTIVE: Students will become familiar with the Media Center and learn to use its resources both in carrels and in the Media Center.

7. GOAL: To provide an environment in which any competition among students is positive.

OBJECTIVE: The program will provide recognition for student achievement through publication of an honor roll.

OBJECTIVE: Students will be able to monitor their progress on a daily basis through use of progress charts.

OBJECTIVE: Students will have opportunities to work cooperatively with other students.

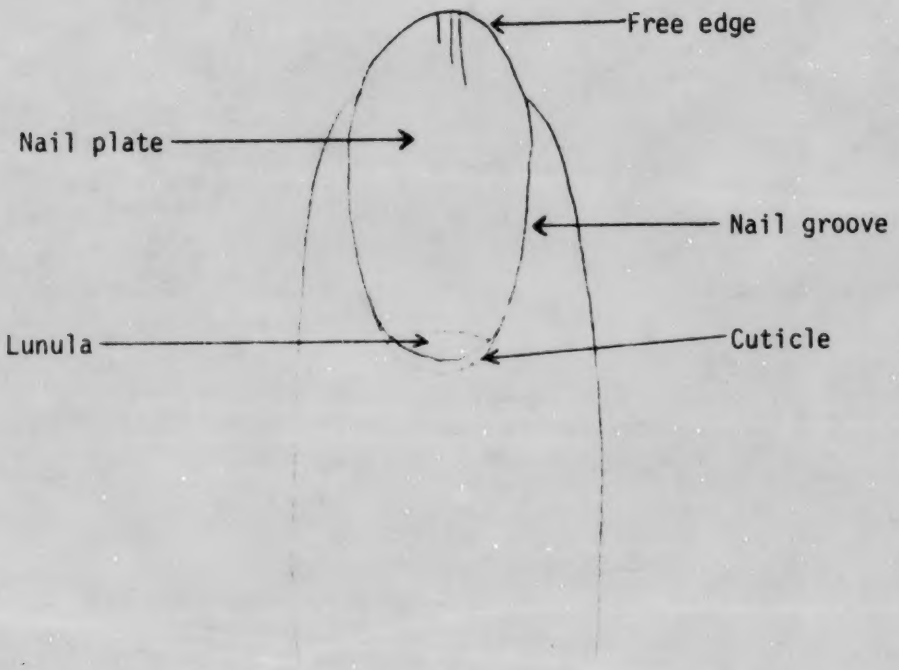
OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER 9th & 10th grade

OCCUPATION Beautician - Manicuring (basic)

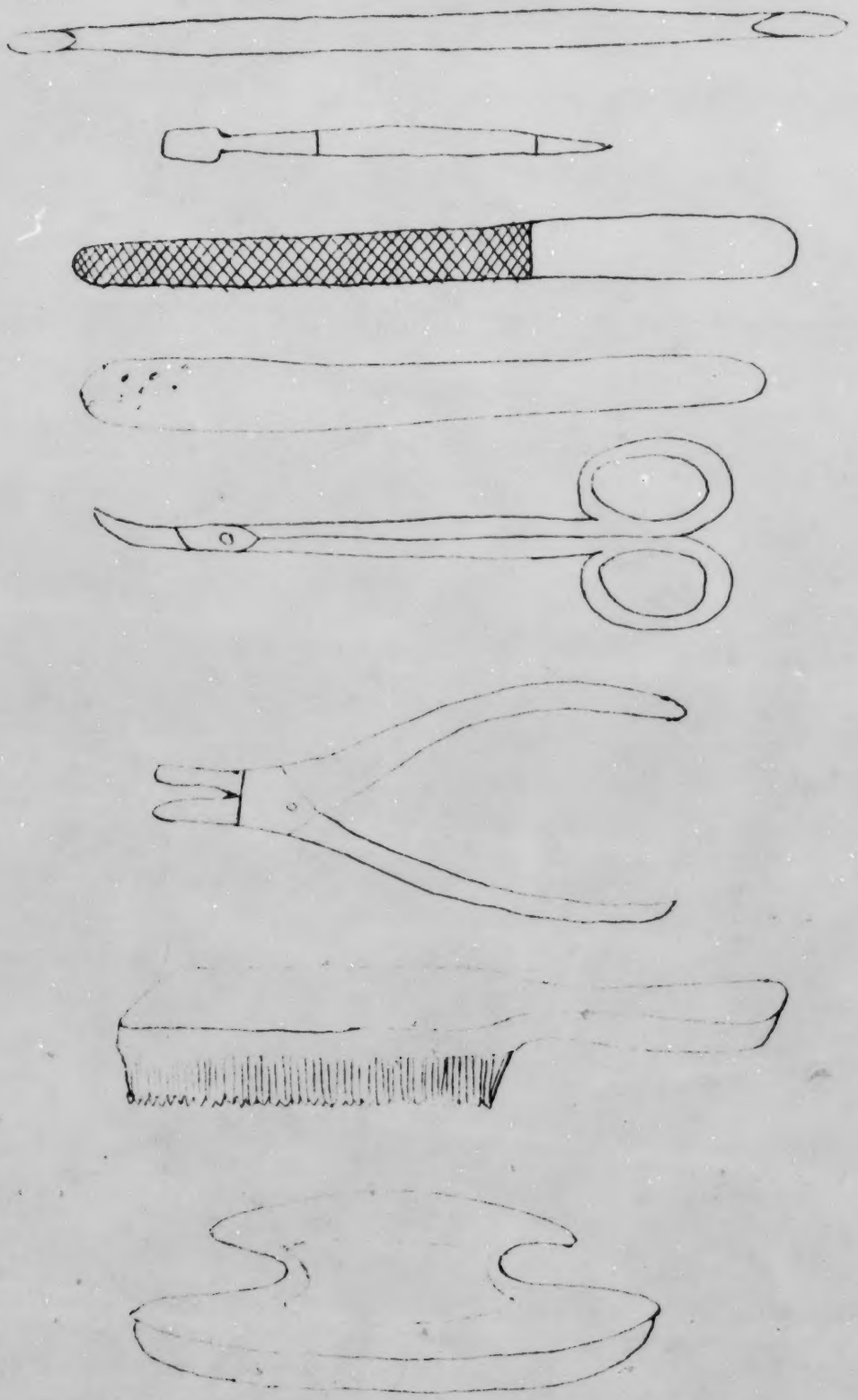
LESSON OBJECTIVE To know the purpose of a manicure, structure of the nail, and disorders of a nail. Be able to give a basic manicure and hand massage. Know the implements used in a basic manicure, and to know how to set up a manicure table.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Basic manicure a. learn safety rules in manicuring b. use of implements c. basic parts of the nail d. demonstration by instructor e. hands-on-activity f. related vocabulary	Prepare manicure table Name implements used Give a basic manicure and hand massage Know vocabulary related to subject	Film and books Manicure implements and supplies Hand-out sheets along with safety rules and general information Creams and polishes etc. used for a manicure Film "Giving a Basic Manicure"	1½ hours plus practice time	Quiz on parts of the nail and naming manicure implements List step-by-step procedure for a basic manicure Visual observation by teacher. All students hands-on experience Graded on a manicure to classmate Film "Giving a Basic Manicure" Book - Standard Book of Beauty Culture Hand-out sheet and safety rules

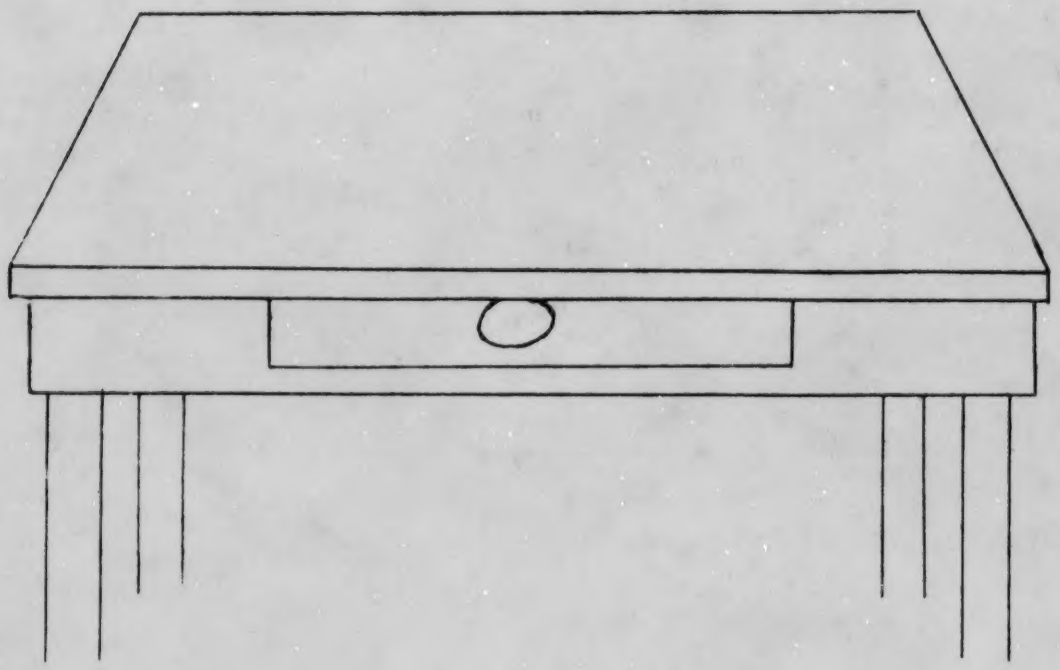
PRINCIPLE PARTS OF THE NAIL



Implements used in a basic manicure



Place supplies on manicure table--by number and name



1. Towel-wrapped pillow
2. Steel files
3. Emery board
4. Cotton container
5. Alcohol
6. Nylon or stiff-bristle brush
7. Finger bath
8. Buffer
9. Wet sanitizer containing manicure implements
10. Tray with nail cosmetics

NAME_____

A.M. DATE_____ 125-D

SERVICE OCCUPATIONS

Manicure Quiz

1. List at least six implements used in a manicure.
   a.
   b.
   c.
   d.
   e.
   f.
2. List the five basic parts of the nail and give their location.
   a.
   b.
   c.
   d.
   e.
3. List the step-by-step procedure in giving a manicure.

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Beautician - Shampooing

LESSON OBJECTIVE 1. To make students aware of the safety rules while giving a shampoo 2. To have student be able to prepare the supplies and the patron, and to give the correct manipulations during a shampoo.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Shampooing a. Learn types of shampoos b. Implements, supplies, and equipment used c. Safety of a shampoo d. Hair brushing e. Draping of patron f. Proper manipulation g. Proper rinsing of hair h. Proper combing of the hair after the shampoo Teacher Demonstration Filmstrip A Basic Shampoo Handout copies of Safety Rules	View film and discuss safety rules and procedure of a shampoo "Hands-on" experience Brush hair Cape patron (classmate) Give shampoo using proper manipulations	Shampoo chair and sink Shampoo Combs and brushes Neck strips Towels Shampoo Cape Disinfectants for cleaning equipment Copy of Safety Rules Filmstrip: A Basic Shampoo	1 hour	Quiz on Safety Rules and listing step-by-step procedure of a shampoo Visual observation by instructor

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Beautician/Fingerwaving

LESSON OBJECTIVE 1. To have students learn to use fingers and comb properly to do fingerwaving on a model.

2. To have students understand the relationship of fingerwaving to hair styling.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Knowledge of basic fingerwave. a. Preparing the hair for combing b. Pre-molding and shaping hair for waving pattern c. Holding comb properly and proper movement of fingers (important) d. Know what a ridge is in relation to a wave	Prepare model for combing 1. Wet hair and comb it smooth 2. Apply proper amount of setting lotion 3. Practice finger and comb movements 4. Create a style of fingerwaves	1. Model 2. Clamp-tray 3. Combs, cape 4. Setting lotion	2 hours	Quiz on basic fingerwave procedures Visual observation during fingerwaving practice Grade on finished model

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Beautician/Roller Setting

LESSON OBJECTIVE To have students use their hands along with the equipment used in doing a roller set.

To have students comb, part and set a model in a style.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Roller Setting a. Learning correct partings before roller setting b. When and where not to place a roller c. Determine the style and size of rollers to be used d. Learn proper way to clip rollers to hair e. Become able to use fingers and control roller while setting	1. Shampoo hair 2. Towel dry 3. Assemble all materials and supplies 4. Section hair 5. Do complete roller set	Model Rollers Water Setting lotion Combs, brushes Clips Shampoo Hair spray	2-4 Hours	Visual observation Graded on neatness ar finished set

A.M.

NAME_____

DATE_____ 128-A

Service Occupations

Beauty Culture Vocabulary

Use each word in a sentence

roller curls

panels

roller base

roller diameter

barrel curl

cylinder rollers

volume

shampooing

manicuring

shampoo cape

neck strip

hair rinse

manipulations

nail plate

free edge

matrix

nail groove

lunula

cavities

OCCUPATIONAL CLUSTER: Service Occupations

CLUSTER OBJECTIVE NUMBER:

OCCUPATION: Hospitality/Table Setting and Serving

LESSON OBJECTIVE: To have students set a proper dinner table and/or Banquet Table

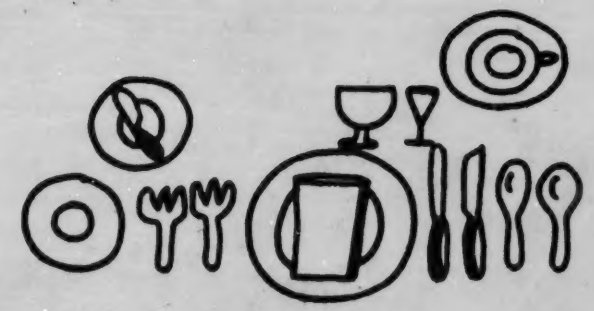
LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Size of table and seating arrangements to be used 2. Arrangement of silverware on table--placement and amount to be used 3. Use of table placemats or linen cloth, or both 4. Styles of folding napkins (linen or paper) 5. Decorating arrangements for all occassions 6. How to serve each course during breakfast, lunch, or dinner	Set tables in 3 different styles (Banquet, Family, Formal Serve guests	Table and chairs Linen cloths and napkins Paper placemats China, silver, etc. Decorations for table Trays for serving	1 hour	Visual Observation "Hands-on" learning by doing Being able to do and identify different table settings Know how to Book: Waiter/Waitress Handbook

NAME _____

DATE _____

TABLE SETTINGS

FAMILY



FORMAL

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Hospitality/Hostess or Captain in Restaurant

LESSON OBJECTIVE To have student understand managerial duties which relate to the running and staffing of a dining room.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Hostess/Captain Managerial duties a. Oversees activities of staff in the dining room b. Distributes guests to seating locations to avoid over-crowding of one section. c. Inspects dining room for cleanliness and supplies d. Handles grievances of guests e. Inspects dining room personnel for grooming f. Takes reservations, number of guests, time, etc.	Role Playing: Students take on identity of Hostess/Captain, work on making reservations, seat guests, and give menus. Assign waiters and waitresses to tables. Learn to speak on a phone	Reservation book Check list for restaurant dining room Menus Keys Reservation calender	1 hour	Visual observation Written Quiz on listing duties and responsibilities of the Hostess/Captain

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Hospitality Management/Bus person duties

LESSON OBJECTIVE Students will understand and perform the duties of a Bus person in a restaurant

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Bus person a. Assists waiter/waitress and Hostess/Captain b. Set-up serving stations in dining rooms with all c. Learn table setting and clearing of tables d. Refills water glasses proper procedure	Role Playing: with Waiter/Waitress and Hostess, set table, clean floor, pour water	Trays Tub Table replacements Linens Glasses Dishes Silver Broom and dust pan for clean-up Pitcher for water	1 Hour	Visual observation by teacher Quiz listing duties of Bus persons Reference Book: Waiter/Waitress Handbook of Food Service

OCCUPATIONAL CLUSTER: Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION: Waiter/Waitress - Hospitality Management

LESSON OBJECTIVE: 1. To have students learn the following: (a) Procedures in serving foods (b) Reading menus (c) Writing checks (d) Adding figures. To have students understand importance of attitude and personal appearance while working as a waitress/waiter.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Waiter/Waitress a. Personal attitude b. Personal appearance c. Ability to read and understand menu terminology d. Know how to set a table properly e. Know how to fill out a check and add the figures f. Learn menu terminology and identify foods listed g. Learn how to carry a tray and pour water glasses h. Be able to handle customer complaints	1. Role playing in restaurant setting - all students take part of customers, waiters, and waitresses 2. Learn the menu, take orders, write checks, carry trays, set tables add check figures. 3. All students view film strips: Customer Customer Courtesy and Restaurant Atmosphere 4. Class discussion on both films.	Films Customer Courtesy and Restaurant Atmosphere Menus Checks Table and chairs Placemats Linen cloth and napkins Dishes and silverware Trays, pitchers, glasses	2 Hours	Quiz on Vocabulary from menu Student teacher observation and evaluation during role playing Vocabulary related to area Reference Books: Foods Service Vocabulary Careers in Focus Films: Customer Courtesy and Restaurant Atmosphere

NAME_____

DATE_____ 132-A

SERVICE OCCUPATIONS

Food Service Vocabulary II

Use each word in a sentence

bus

buspan

canape

carte du jour

check run

coagulate

coating

colander

combination salad

condiment

consomme

creole

crepes

crepes suzette

croutons

cutting board

deep fry

delicatessen

A.M.

NAME_____

DATE_____ 132-B

SERVICE OCCUPATIONS

PUZZLE

Below are some of the vocabulary words you have been learning. They are spelled correctly. Make an alphabet puzzle by following the directions in the carrol.

alacarte	augratin	bland	braise
alaking	aujus	blend	brazier
alamode	baste	boiling point	broil
antipasto	blanch	bouillon	buffet
appetizer			

NAME_____

DATE_____ 132-C

SERVICE OCCUPATIONS

FOOD SERVICE VOCABULARY-I

Use each word in a sentence.

alacarte

alaking

alamode

antipasto

appetizer

augratin

aujus

baste

blanch

bland

blend

boiling point

bouillon

braise

brazier

broil

buffet

bread

NAME_____

DATE_____ 132-D

SERVICE OCCUPATIONS

RESEARCHING AND DEVELOPING

Sample Menu Form

MAIN ITEMS	PRICE
SIDE ORDERS	
DESSERTS	
BEVERAGES	

NAME_____

DATE_____ 132-E

SERVICE OCCUPATIONS

Vocabulary

1. Atmosphere: general tone or mood in a restaurant
2. Attitude: your way of acting, feeling and thinking
3. Competence: ability and skill
4. Efficiently: in a way that saves time, effort, and money
5. Graciously: in a kind and courteous manner
6. Impression: the effect you have on someone
7. Maitre d': (Hostess) the head waiter or waitress in a restaurant - often greets and seats customers
8. Pick-up: a dish that is prepared ahead of time.
9. Anticipate: to see and perform in advance
10. Buffet: a service style in which food is set out on tables for self-service
11. Clientele: customers
12. Personnel: employees

A.M.

NAME_____

DATE_____ 132-F

MAKING AN APPEARANCE

VOCABULARY

Waiters, Waitresses, Beauticians, Hotel/Motel Personnel

Use each of the following words in a sentence.

1. Acne

2. Blackhead

3. Pimple

4. Medicated soap

5. Dermatologist

6. Antiperspirant

7. Deodorant

8. Dandruff

9. Hair conditioner

10. Manicure

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Foods Preparation

LESSON OBJECTIVE The students will observe the procedure of cutting up a whole chicken, will discuss the economical concept, and will see and discuss a film on meatcutting as a career.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Teacher demonstration - cutting up a whole chicken procedure and identification of parts. 2. Discussion of cost per pound-purchasing a whole chicken vs. chicken parts. 3. Career film on Meatcutters 4. Discussion of career possibilities in meatcutting locally and qualifications required.	Student volunteer to cut up another whole chicken with classmates watching and discussing procedure and identifying parts. Students to watch film and join in discussion after film.	2 whole chickens Cutting board Poultry shears Colander Chalkboard Price comparison information for discussion Film and projector	30 minutes app. 20 minutes app. 30 minutes app.	Chickens cut up correctly, with classmates input and identification of parts Participation in discussion of cost per pound. Whole chickens vs. parts Discussion of key points in film Qualifications Skills Opportunities

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Foods Preparation/Cooking Eggs

LESSON OBJECTIVE Students will observe a demonstration on cooking eggs in a variety of ways, and will participate by cooking eggs.

CAREER RATIONALE: Fast food restaurants, diners, etc., prepare and serve eggs.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Teacher Demonstration Methods: 1. Fried - up and over 2. Scrambled 3. Poached 4. Soft Cooked 5. Hard Cooked Discuss end results when: 1. Using a lid 2. Adding salt 3. Overcooking 4. Undercooking Review cooking terms and methods. Discuss other ways to prepare eggs.	1. Student will choose a 5 x 8 card, with directions for preparing eggs one way. 2. Student will follow directions to prepare egg and will make beverage and toast if desired. 3. Student will eat food.	Turners, forks, spoons Fry pan or saucepan Timer Serving dishes Seasonings and ingredients	Demo. 30 minutes Individual student approximately 20 min.	Teacher observation of student Preparation and finished product Taste test Verbal-review method and terms Student written evaluation form of the food prepared.

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Baking

LESSON OBJECTIVE The student is scheduled to visit and work in the Vo-Tech Bake Shop/Classroom to have a "hands-on" experience in mass production baking methods and skills.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. The student is introduced to general measuring, recipe reading, baking concepts, etc. through teacher lessons films and "hands-on" experiences in the Service Occ. Classroom before being scheduled to go the the Vo-Tech Bake Shop.	1. The class is taken to the Bake Shop for a brief visit to have a general idea of what to expect when they are scheduled to spend the morning at the Bake Shop. 2. Each student will have at least one, preferably two ½ days, to spend working "hands-on" at Vo-Tech.		Minimum 2½ hours 5 hours desired	Teacher discussion with student of what student has learned, and experienced at Bake Shop Written and/or verbal communication with Bake Shop teacher re: students' performance and cooperation.

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Foods/Microwave

LESSON OBJECTIVE After listening to a lesson on the use of a Microwave Oven, the student will use the microwave to cook food.

CAREER RATIONALE: Many restaurants now have Microwave Ovens in use.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Teacher presentation on Microwave Oven a. Theory (basic concepts) b. Safety rules c. Utensils d. Recipes 2. Demonstration of setting controls 3. Demonstration of bringing water to a boil. 4. Demonstration of cooking hot dogs and warming roll.	1. Listen to lesson and participate in questions and answers. Voice opinions 2. Copy list of safety rules 3. Watch demonstration of setting controls and water boiling and cooking food. 4. Follow directions for cooking hot dog and warming roll.	1. Microwave Oven Safety Rules Poster 2. Cooking Utensils 3. Hot Pan Holder 4. Recipe book (Microwave) 5. Pencils/paper 6. Pyrex 1 cup measuring cup 7. Hot dogs 8. Rolls 9. Condiments	Teacher Demo and Lesson - 30 to 45 minutes Each student to cook approximately 10 minutes total	Student use of Microwave Oven with teacher supervision Successful cooking of hot dog and warming of roll. (Following directions and safety rules) Verbal - Opinion of Microwave Cooking experience and of food.

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Foods Preparation/Strombolis

LESSON OBJECTIVE The student will participate in making Strombolis. Portion control, mass production, packaging, and sales concepts are experienced.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Teacher Demonstration of procedure to make Strombolis a. Making yeast dough b. Weighing lunchmeat and cheese ingredients. c. Packaging Strombolis for sale to school staff 2. Discussing cost and sale price.	1. Participation in making the number of Strombolis ordered from staff. Example: making dough rolling dough weighing dough weighing and arranging ingredients packaging Strombolis handling money	Bowls Mixing spoons Measuring tools Mixer Rolling pin Cutting board French knife Scale Aluminum foil Plastic wrap Food ingredients for fecipe	Demonstration and completion of one Stromboli 2 hours Stromboli sale day-5 to 6 hours	Teacher observation of students following directions to completion, i.e., using equipment correctly measuring correctly weighing correctly etc.

OCCUPATIONAL CLUSTER: Service Occupations CLUSTER OBJECTIVE NUMBER:

OCCUPATION: Hotel/Motel/Maintenance/Housekeeping-Indoor Rooms

LESSON OBJECTIVE: To have students understand the responsibilities of the Housekeeping Department in a Hotel/Motel indoor room.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Housekeeping Hotel/Motel a. Know how to set up the cleaning cart with needed supplies b. Be able to take a visual check of the room's needs c. Make the beds properly and quickly d. Empty ashtrays and wastebaskets e. Polish furniture and vacuum rugs f. Clean and stock bathrooms g. Replace linens	Load the cleaning cart with supplies in the correct order Make beds Clean bathrooms	Maids Cart Linens Cleaning supplies Soaps Wrapped glasses Film-Hotel Industry Handout sheets listing duties	1-2 hours	Visual Observation of teacher Written Quiz on how to prepare the cleaning cart Book: Job Career Information

A.M. & P.M.

SERVICE OCCUPATIONS

CHECK LIST-MAID SERVICE

Good Condition	Fair Condition	Poor Condition	
			Floors
			Corners
			Window Frames
			Window Sills
			Venetian Blinds
			Drapes
			Lights
			Radiators
			Chairs
			Desks
			Waste Baskets
			Filling Cabinets
			Wall Cabinets
			Floor Cabinets
			Book Cases
			Tables
			Telephones
			Electric Fans
			Beds
			Refrigerators
			Doors
			Walls
			Night Stands
			Dressers
			Rubbish Barrels
			Ash Trays
			Pictures
			Upholstered Furniture
			Wash Rooms - Partitions
			Vents
			Light Fixtures
			Tile Walls
			Toilet Bowls
			Urinals
			Wash Basins
			Soap Dispensers
			Paper Towel Dispensers
			Toilet Paper Dispensers
			Plumbing Fixtures
			Mirrors

Name_____

Date_____ 138-B

Housekeeping Service I
Hotel/Motel

A. Equipment found on maids cart:

It is very important to have the maids cart near at hand and properly stocked with the following:

1. Buckets
2. Detergents
3. Various cleaners
4. Dust cloths
5. Soaps and toilet tissue
6. Wrapped glasses
7. Clean linens

B. How to enter the guests room properly. Look for:

1. Door-lock indicators or "Do Not Disturb" signs.
2. Knock on door.
3. Make entry inspection.(over-all view of room)
4. Check equipment and furniture for any damage.
5. Complete a damage report if necessary.
6. Report any article left behind to the front desk or manager.

C. Cleaning the room:

1. After taking an over all "view" hang any articles of clothing.
2. Check ashtrays, glasses, linens and litter.
3. Change linens and make beds.
4. Dust and polish furniture.
5. Clean mirrors, soap dish, and glass rack.
6. Clean wash basins and counter tops.
7. Clean tub and toilet bowl and seat.
8. Check all bath room supplies.
9. Clean bathroom floor and bedroom carpets last.
10. Before leaving the room give an over view of the entire area and go over the check list of supplies.

SERVICE OCCUPATIONS
HOUSEKEEPING

Have you ever stayed in a motel and then heard your parents vow that they would never return there again? Maybe there was a spot on the curtains or a cigarette burn in the rug. The bed wasn't comfortable or there was algae growth in the bathroom. There was a wasp nest right outside and a few wasps somehow managed to get into your room. The swimming pool was dirty or the shower curtains needed a good cleaning.

Any of the above problems are the responsibility of the Executive Housekeeper. This individual is responsible for the cleaning and maintenance of the front desk area and lobby, guest rooms and outside grounds. An inefficient housekeeper can ruin a hotel's reputation faster than anything else in the industry.

You maybe surprised to know that most of the business in the lodging industry comes during the work week from business men and professional men who are attending meetings or making transactions in the area, or attending conventions. They are working on a tight schedule often under great pressure and expect their rooms to be clean and in order when they finally get time from their business for rest. Any problems and they just might move their belongings to a competiter's motel down the street.

The second major sources of business in the Hotel/Motel industry is, of course, people on vacation. People work and save for 48 to 50 weeks a year for one or two weeks vacation. Anything short of perfect cleanliness in accomodations and vacationers will make reservations elsewhere the next time they plan to return to your locality.

The Executive Housekeeper has the following responsibility:

1. Hire and train maids and housemen.
2. Purchase supplies used in the department.
3. Keep inventories of supplies
4. Is involved in the interior decoration of rooms and front office.
5. Keeps all housekeeping records.
6. Reports regularly to the manager the repairs and improvements needed and made.

The maids have many responsibilities. In an eight hour shift a maid is expected to clean from ten to fourteen rooms depending on the size and decor of the rooms. Following is a general list of duties. The job description for a maid in a hotel or motel would be more explicity explained.

1. Make beds with fresh linens.
2. Empty all asntrays and wastebaskets.
3. Dust furniture and vacuum rug.
4. Check the room carefully for any valuables left by guests if the room is unoccupied. Immediately give the items to the executive housekeeper.

5. Clean the bathroom.
6. Supply the bathroom with new soaps, towels, and wash cloths.
7. Place stationary, literature and motel information in top bureau drawer.

The housemen have many responsibilies:

1. In general they do heavy work which most maids are unable to perform.
2. The housemen are responsible for keeping the floors polished and rugs shampooed.
3. The housemen are responsible for keeping the storage and linen rooms neat and clean.
4. The housemen pick up the dirty laundry left outside the rooms by the maids.
5. The housemen will often vacuum the swimming pool.

The Maintenance Department

The manager of a hotel or motel had a difficult decision to make when considering the maintenance department. Large hotels have an engineering department which includes boiler room man, carpenters, electricians, plumbers, and painters. Small motels may combine house and maintenance duties. Often managers of small motels will perform all maintenance duties themselves and contract any jobs that they can't handle. Many managers keep careful records to see if it is more economical to pay salaries to maintenance specialists or to contract jobs to professional plumbers or electricians when a problem develops.

Maintenance men employed in the Hotel-Motel Industry have the following responsibilities:

1. Maintenance of all heating and air conditioning equipment.
2. Maintenance of the swimming pool filteration system and chemistry.
3. Maintenance of electrical equipment such as lightbulbs and switches, etc.
4. Follow a preventive maintenance system so that all equipment functioned properly with as few breakdowns as possible.

Be sure to include:

a. Numbered door
b. Windows
c. Curtains, shades, drapes
d. Air conditioning and heating unit
e. Lamps
f. Wall or ceiling lights
g. Beds
h. Desk
i. Chairs
j. Pictures
k. Mirrors
l. Bureaus
m. Closets
n. Telephone
o. Night tables
p. Sink and bathroom built-in table area
q. Toilet
r. Shower curtain
s. Towel racks
t. Medicine closet

OCCUPATIONAL CLUSTER: Service Occupations CLUSTER OBJECTIVE NUMBER:

OCCUPATION: Hotel/Motel Heavy Duty Maintenance

LESSON OBJECTIVE: To make students aware of heavy-duty housekeeping duties and responsibilities

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Heavy Duty Maintenance Responsibilities: a. caring for outside grounds b. Caring for pools c. Polishing floors d. Cleaning carpets and drapes e. Carpenter repairs f. Tend to boiler-room g. Small electrical repair h. Contract outside jobs	1. Go on job related duties within school for visual and "hands-on" experience 2. List all duties and responsibilities 3. Watch film: Hotel/Motel Industry	1. Tools for maintenance 2. Cleaning agents 3. Chemical agents 4. Floor polishers 5. Carpet Cleaners	1 Hour	Visual observation Quiz on listing jobs and responsibilities Film: Hotel/Motel Industry Career Information Booklet

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Sewing/Terms and Tools

LESSON OBJECTIVE The student will complete a word scramble and a puzzle which includes sewing vocabulary introduced in a previous lesson.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Previously the student has had a lesson on sewing terms tools, etc. with visuals. 2. Word scramble and puzzle to be completed to reinforce sewing vocabulary recognition of tems and tools etc.	1. The student will complete a word scramble. 2. Using the word scramble as a reference the student will complete a puzzle of sewing vocabulary.	1. Pencil 2. Handouts a. Word Scramble b. Puzzle c. Definitions	Approximately 1 hour total	Correct answers in word scramble and puzzle indicates student understanding of previous lesson introducing same.

Name _____ Date _____

Crossword Puzzle

Across

1. Place thru the eye of a needle for sewing
2. A tool used to put markings on fabric before sewing
3. A tool used to cut fabric
4. Fabric construction: with loops that are interlocked
5. The paper pieces used when cutting out a garment
6. Diagonal direction of fabric
7. Fibers are processed to create fabrics with a mat finish and having no grainline
8. A small sharp tool used to sew fabric together
9. Another name for cloth
10. The grain that runs across the cloth from one selvage to the other
11. Fabric construction: with threads interlaced lengthwise and crosswise

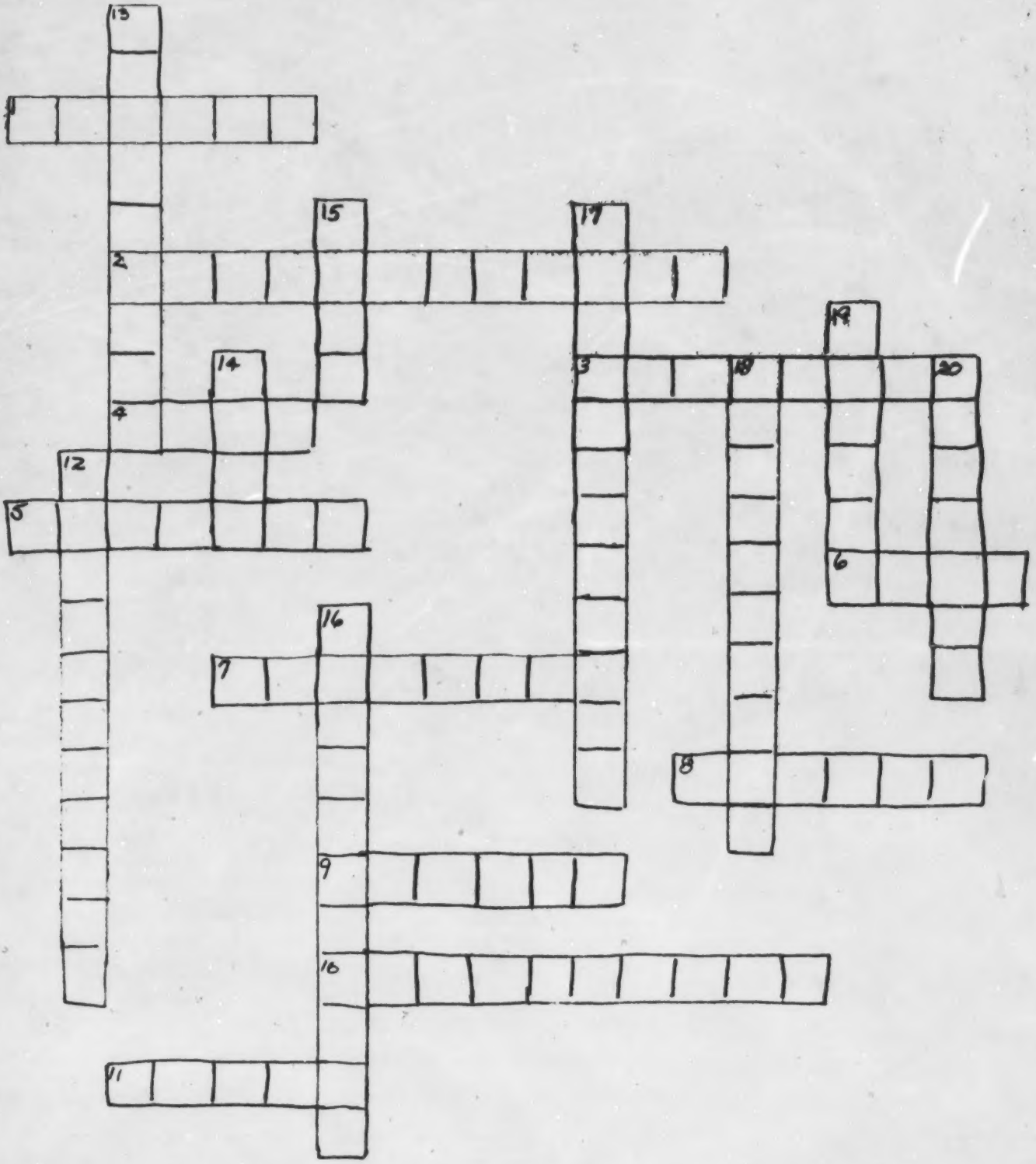
Down

12. A flexible measuring tool
13. A rigid measuring tool
14. How large or small your clothes are
15. Used to hold two pieces of fabric together before sewing
16. An extra layer of fabric sewn inside of collars, facings, etc. to give shape & form
17. Needed in order to know what size will fit you
18. A tool used to take out stitches
19. A large roll of cloth
20. The lengthwise edge finish of fabrics

NAME _____

DATE _____ 140-B

SEWING VOCABULARY PUZZLE



ne _____ Date _____

SEWING VOCABULARY - WORD SCRAMBLE 140-C

Yardstick	Knit	Selvage
Fabric	Bolt	Non-woven
Size	Pins	Bias
Measurements	Thread	Scissors
Needle	Crossgrain	Seam Ripper
Interfacing	Pattern	Tape Measure
Tracing wheel	Woven	

1. sipn _____
2. alseveg _____
3. iabs _____
4. reahdt _____
5. delene _____
6. kcitrayds _____
7. ptae sauemer _____
8. ssssoicr _____
9. gancosrsri _____
10. neowv _____
11. tnreatp _____
12. tnik _____
13. ribfac _____
14. btlo _____
15. zies _____
16. asensmmeture _____
17. ctrangi ewelh _____
18. msae pripre _____
19. fgnnerigatc _____
20. onn ovwne _____

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Sewing/Measuring

LESSON OBJECTIVE The student will measure another student to determine correct pattern size for clothing (optional

The student may take his or her own measurements if uncomfortable working with another student.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Lesson on Pattern information; includes measuring for correct size - male & female 2. Considerations: Chest or bust Waist Inside leg seam Neck Sleeve length Back to waist length Height and weight	1. Students will watch how to measure for size 2. Students will measure each other (optional) and record measurements 3. Then from recorded measurements the student will determine correct patter size from reference page on pattern book.	1. Tape Measure 2. Pencil and paper 3. Pattern book 4. Yard stick 5. Scale	Measurement part of lesson on pattern info takes approx. 15 minutes Student participation about 5 minutes per student	Teacher supervision of measuring and recording of measurements. When student has decided on a size, discussion with tea will confirm or hel student to find correct size.

OCCUPATIONAL CLUSTER Service Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Upholstery/Stripping Chair

LESSON OBJECTIVE The student will strip an old chair, layer by layer, in preparation for future upholstering

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Teacher Demonstration of stripping methods. a. Remove outside covering and cambric b. Remove muslin, padding, horsehair, etc. c. Remove all nails from frame. d. Cut springs loose 2. Demonstration of correct usage of stripping tools and safety	1. Students will watch teacher demonstrate use of tools in removing 1 layer at a time 2. Students participate in removing layers, with teacher supervising	Mallet Chisel (ripping) Pliers Claw hammer Scissors Screwdriver Tack lifter Upholstering knife	Varies according to chair. 1 hour minimum several hours for large overstuffed chair	1. Teacher observation of correct and safe use of tools and students following directions on removal of layers with teacher supervision 2. Inspection of chair completely stripped.

CAPE MAY COUNTY VOCATIONAL SCHOOLS
Crest Haven Road, Cape May Court House, NJ 08210

TECHNICAL OCCUPATIONS - COURSE DESCRIPTION

The cluster program is open to ninth grade students for approximately nine weeks and to tenth grade students for one year on a half-day shared-time basis. The student will spend a half-day at the Career Center and a half-day at the home school. The ninth grade student will explore four different occupational clusters before selecting a pre-vocational cluster for further study in the tenth grade. Upon completion of the program, the tenth grade student may enter one of the applicable vocational shops or cooperative programs in the Cape May County Vocational Schools.

The general purpose of both ninth and tenth grade programs is to introduce the students to at least six basic occupational areas within the technical occupations field for career awareness and development of practical occupational skills. The occupations explored will be: automotive technician, draftsperson (architectural and machine), communications technician, electronics technician, computer technician, and operating technician. Theory and "hands-on" activities are combined to explore the occupational requirements and working environment of these areas in order to help the student make intelligent decisions of possible career choices based on levels of interest and ability. Included will be the necessary mathematics, applied science, and English as related subject areas.

TECHNICAL OCCUPATIONS - GOALS and OBJECTIVES

1. GOAL: To explore the students' own interests, abilities, and needs in each of the six occupational areas of technical occupations to determine their own potential and to make better career choices in the technical occupations field.

   OBJECTIVE: Students will be able to identify the variety of technical careers available.

   OBJECTIVE: Students will explore job opportunities, working conditions, locations, financial gains, job security, and training period for each occupational classification which would be personally satisfying.

   OBJECTIVE: Students will receive training in the general skills of employment-seeking including resumes, interviews, and job descriptions.

   OBJECTIVE: Students will experience "hands-on" activities in each of the technical career areas.

2. GOAL: To develop the general skills necessary for successful performance in the technical occupations field.

   OBJECTIVE: Students will be able to recognize and properly utilize the various tools, materials, and equipment appropriate to each occupational classification.

   OBJECTIVE: Students will be able to describe and perform some of the skills necessary for job entry in each occupational classification.

   OBJECTIVE: Students will be able to identify, spell, define, and use basic trade terminology and related information used in each occupational classification.

   OBJECTIVE: Students will learn, demonstrate, and practice the shop safety and practices unique to each occupational classification.

   OBJECTIVE: Students will be able to perform basic operations of addition, subtraction, multiplication, and division of whole numbers, fractions, decimals, and percentages applicable to each occupational classification.

   OBJECTIVE: Students will be able to use both English and metric measurements as applicable to each occupational classification.

3. GOAL: To provide specialized and individual kinds of educational experiences necessary to meet the needs of each student.

   OBJECTIVE: Students will have the opportunity to work independently on individual carrel projects.

   OBJECTIVE: Students will have the opportunity to work at a variety of work stations.

   OBJECTIVE: Ninth grade students will learn to utilize their time on a limited basis to work on projects of their own choosing.

   OBJECTIVE: Tenth grade students will learn to utilize their time on an expanded basis to work on projects of their own choosing.

   OBJECTIVE: In line with their abilities, students will learn to efficiently manage working time allotted in the shop to meet assigned project deadlines for both individual and group projects.

4. GOAL: To provide significant opportunities consistent with the age of the student and to help determine the nature of educational experiences of the student.

   OBJECTIVE: Students will experience basic applied science and other theory as well as "hands-on" applications in each of the occupational classifications.

   OBJECTIVE: The ninth grade student will be able to explore various technical occupations during a nine-week period.

   OBJECTIVE: The tenth grade student will be able to understand, acquire, maintain, and progress in skills and competencies essential to technical occupations during a one-year period.

5. GOAL: To increase the students' self-awareness and self-understanding.

   OBJECTIVE: Students will explore their vocational and avocational interests and abilities.

   OBJECTIVE: Students will begin to build an awareness of "where I am" compared to "where I want to be."

   OBJECTIVE: Students will begin to relate awareness and attitudes to specific or related occupational clusters.

   OBJECTIVE: Ninth grade students will select an occupational cluster for in-depth analysis.

OBJECTIVE: Tenth grade students will choose a tentative career in which they can pursue vocational training.

6. GOAL: To help students learn to enjoy the process of learning and to acquire the skills necessary for a lifetime of continuous learning.

   OBJECTIVE: Students will be encouraged to develop an appreciation of and pride in the value of work and the completion of tasks.

   OBJECTIVE: Students will be helped to develop confidence in their own abilities.

   OBJECTIVE: Students will demonstrate their willingness to learn traits through good attendance, punctuality, and factors essential to success on the job.

   OBJECTIVE: Students will become familiar with the Media Center and learn to use its resources both in carrels and in the Media Center.

7. GOAL: To provide an environment in which competition among students is positive.

   OBJECTIVE: The program will provide recognition for student achievement through the publication of an honor roll.

   OBJECTIVE: Students will be able to monitor their daily progress through use of progress charts.

   OBJECTIVE: Students will have opportunities to work cooperatively with other students.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive/ Electronics/Operating Tech./Drafter

LESSON OBJECTIVE To teach students the principles, theory and practice, of an alternator and its importance in generating power for homes, automobiles, and emergencies.

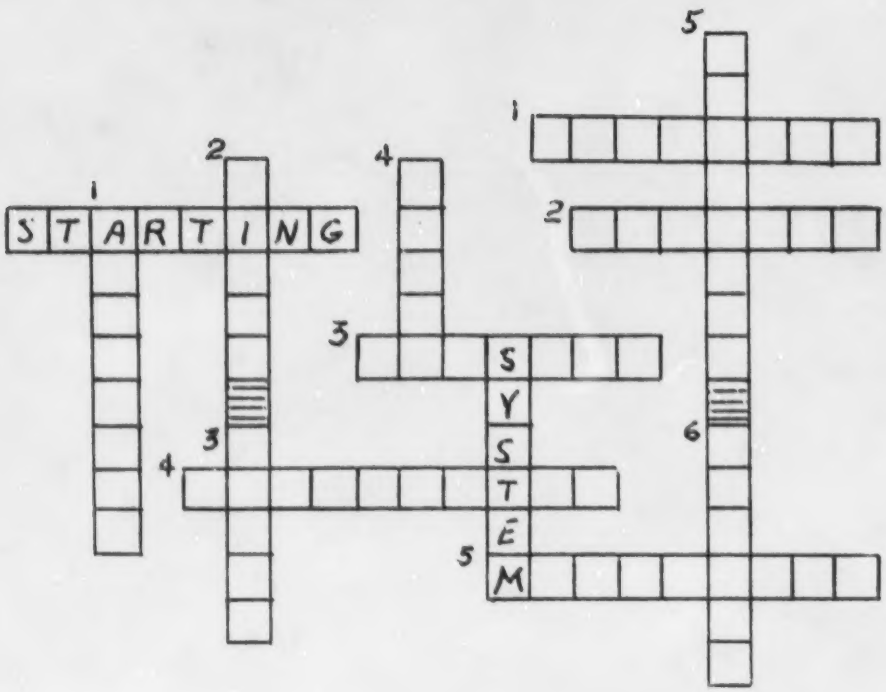
LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
During this project, students will learn, through lecture, and experimentation, about the following: 1. coils 2. magnets/magnetism 3. electro-magnets 4. induction/reactance 5. gears/gear ratios/ mechanical advantage 6. lubrication 7. coefficient of friction of different materials 8. AC vs. DC voltages 9. sine wave 10. voltmeter/oscilloscope 11. basic tools 12. electric motors 13. design drafting	Armed with theory and practical knowledge, students design, submit drawn plans, and actually build a working alternator. The alternator's operation and performance is then carefully analyzed and improved upon until the design is optimized.	Hand tools: vise hammer screwdrivers pliers wood saw hack saw electric drill/bits Materials: magnets epoxy wood dowels hardware (nails/screws) wire Misc. D.C. motors volmeter/oscilloscope batteries	10 to 15 hours	Students' projects are evaluated on the basis of their plans, the originality of design, and the performance (voltage output) of the alternators. The quality of workmanship is also considered. Students are given quizzes on theory related to the project at different intervals.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Technician

LESSON OBJECTIVE Students will be able to identify the components within the starting system of an automobile; and explain the principles and functions of each component.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Identifying and correctly spelling the components and basic principles of the starting system	1. Students complete a cross-word puzzle by reading information and with the visual aid of a starter motor	1. Cross-word puzzle (ditto) 2. Cross sectional detailed drawing of a starter motor 3. 2 pages of information dealing with the starting system	25 minutes	Students are evaluated on how well they complete the cross-word puzzle.



ACROSS

1) An electro magnetic switch that completes the circuit from the battery to the starter motor.

2) Stores electric energy.

3) Conducts electricity to the commutator.

4) This is a switching device, changes the direction of the current going to the armature.

5) The main reason why an electric motor functions.

DOWN

1) This spins within a motor.

2) & 3) Electric magnets mounted on the casing of the motor.

4) Changes electric energy into rotary motion; (starter ___?___)

5) & 6) Part you turn to energize the solenoid.

STARTING SYSTEM

MAGNETISM

Electromagnetism results from current flowing through a wire. When the wire is shaped like a coil, the effect is increased and attraction or repulsion of ferrous metals or other current carrying coils occur. This is the most common use of magnetic properties and is found in motors, generators, meters, transformers, and so forth.

Magnetic lines of force surround permanent magnets and current carrying coils. These form magnetic poles, north and south. A north pole will attract a south pole and visa versa. North poles repel north poles, south repel south. This effect induces motion into motors, relays, and solenoids. Placing the coils about annealed iron frames intensifies the electromagnetic effect.

SOLENOIDS

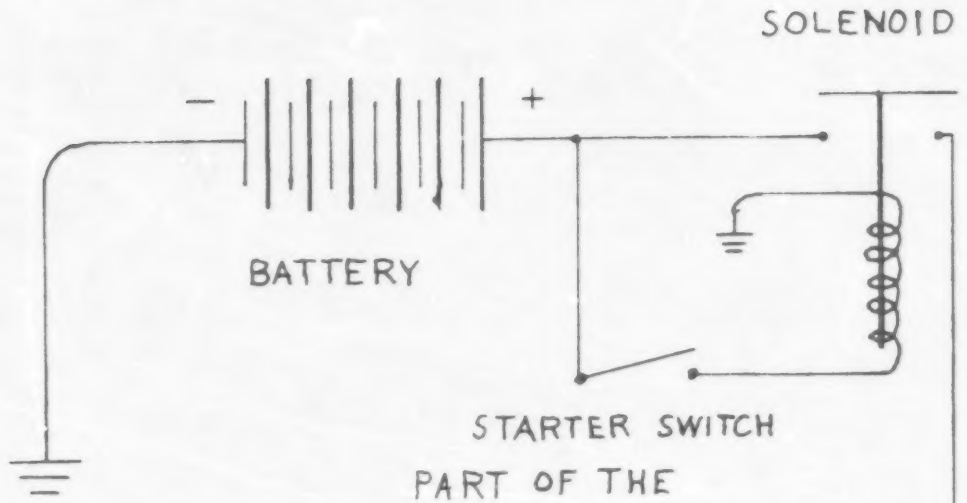
The solenoid is a simple variation of the relay. It is simply a relay with a movable core. The core is held from the center of the electromagnetic coil by a spring. When an electric current flows through the coil, a magnetic field is developed. The core is so positioned that the lines of force travel through the core as well as around the coil. As described in the discussion of electromagnetism, the lines of force travel more easily through metal than air. Therefore, the lines of force take the longer path through the iron core. Since all lines of force try to take the shortest path, a strong force is developed to move the iron core into the center of the coil.

This movement of the core has considerable force and can be put to work. The movement can be used to control fluid power valves, engage gears, or perform any desired linear work. It can also be used to bring heavy electrical contact points together. In this case, the solenoid serves as a switch to carry 100-300 amperes of current from the automobile battery to the starting motor.

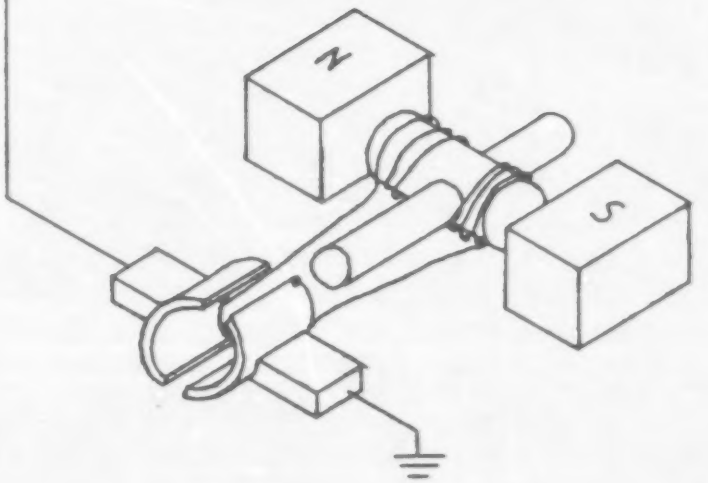
D.C. MOTORS

Direct current motors are used primarily where wide variations in speed is required. They are not so commonly used as are AC motors since most commercial applications call for single or at most, two speeds. Direct current motors are principally used in elevators, cranes, hoist, electric railways, and automobiles.

The DC machine rotates by means of interaction between rotating fields (the armature) and stationary fields (field coils). The energizing of armature coils as they move toward field coils is accomplished by a rotary switching device called a "commutator." Line current is conducted to the commutator by carbon, graphite, or metal blocks known as "brushes." Care of brushes and commutator is the major problem in DC motor maintenance.



STARTER MOTOR



148-D

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Technician

LESSON OBJECTIVE Students will be able to recognize terms and components of the ignition system of an automobile.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Introduction to vocabulary pertaining to the ignition system.	Students will circle listed terms on word search	1. Word search (ditto)	20 minutes	Students will successfully finish the word search

NAME: _____

149-A

WORD SEARCH

S W I T S H B O M S A N G T A I W E I
B A T A I G N I T I O N S W I T C H F
A W Z W I J K I S T H P T N B E U
L D D I S T R I B U T O R C A P Y N
L C S E C O N D A R Y L M N V I R O
A I X J K J I H O U W D K D A M I W
S P A R K P L U G S A O M S O G R
T A Y U C O N T A C T P O I N T S O U
  U C A G F H I I L W R P Q R E V B
R U D N I C E A E A Z P L Y W N F B
E Q P O T U I G N I T I O N X O T E I
S I S T E P U P A S O P N O I T N
I G N I T I F M B C D T I T I M I N G
S B N I T I O N U C C E V H E
T V E R R N C A M U T Y O S U B
O E O T G E F O K D L D W E L L Y L
R U N H I I T J N O V T H T H S N O
U E O R T D O I L O S A I O P T W C
C U T D I S T R I B U T O R N P A E I K
V B N B A L L A C O N K C A M T L
Y R G C O N D E N S E R I F E W O
T I G N I T I O N W I R E S G S T E P

CONDENSER
ROTOR
PRIMARY
SECONDARY
INDUCTION
TIMING
STEP UP
CAM
DWELL
DISTRIBUTOR
CONTACT POINTS
SPARK PLUGS
IGNITION COIL
DISTRIBUTOR CAP
RUBBING BLOCK
IGNITION WIRES
VACUUM ADVANCE
CENTRIFUGAL ADVANCE
IGNITION SWITCH
BALLAST RESISTOR

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Technician

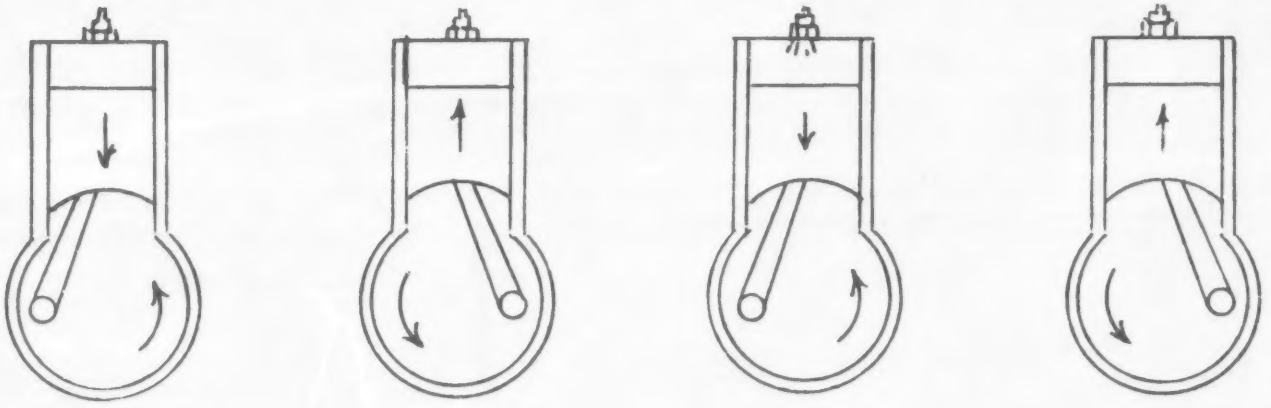
LESSON OBJECTIVE Students will be able to identify and explain the four strokes of the four stroke gasoline engine.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. The ability to read and associate the reading information with the actual working model. 2. Use inductive reasoning to understand the four stroke engine.	1. Students identify the four strokes of a gas engine by operating the model and relating it with the information given. 2. Students answer questions dealing with the operations of the four stroke engine.	1. Working model of a one cylinder four stroke engine. Example: a lawn mower engine with several sections of the block cut out to show the internal components. 2. Ditto handout with information and questions dealing with the four stroke engine.	20 minutes	Students are evaluated by how well they answer the questions on the handout.

NAME: _____ TECHNICAL OCCUPATIONS 150-A

FOUR STROKE ENGINE EXERCISE

DIRECTIONS: Complete labeling the strokes of the four stroke engine. The four strokes are: intake stroke, exhaust stroke, power stroke, and the compression stroke. When finished answer the questions below.



Intake Stroke _____ _____ _____

1) Two valves are needed to control the flow of gasses in and out of the combustion chamber. The intake valve opens during the _____ stroke to permit the air-fuel mixture to flow into the chamber.

2) On the exhaust stroke, the _____ valve opens to allow the burnt gases to escape from the engine.

3) The valves open and close by means of lobes located on the camshaft. How many lobes are there on this one cylinder engine? _____

4) How many lobes would you expect to find on a camshaft belonging to a V-8 engine? _____

5) The camshaft is rotated by a gear located on the crankshaft. How many times does the crankshaft turn in order for the camshaft to complete one revolution? _____

6) How many revolutions does the crankshaft make in order for all four strokes to be completed? _____

7) During the compression and power strokes are either one of the valves open? YES or NO

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Technician

LESSON OBJECTIVE Students will be able to use several instruments used by automotive technicians

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
The ability to accurately use the Dwell-Tachometer and Power Timing Light	Students check and adjust the ignition mock-up using the instruments	1. Ignition mock-up 2. Dwell-Tachometer 3. Power Timing Light 4. Ditto consisting of several exercises and questions to be answered	30 minutes	Students are evaluated on how well they complete the exercises and answer the questions.

NAME: _____

151-A

IGNITION MOCK-UP

Connect the dwell-tach meter and timing light as illustrated on chart. After connections are made, follow the exercises below.

(caution) This equipment can easily be damaged if not properly connected as indicated. If you have any questions on connecting the equipment, please feel free to ask.

1) Using a feeler guage, gap the contact points at .016". Ignition switch should be off and the engine stopped.

2) Record the dwell with the engine running and the ignition switch on. _____

3) If the dwell does not read 30 , adjust the points until the meter reads 30 on the 8 cylinder scale.

4) With the timing light and the tachometer, adjust the timing of the ignition system to 2 before top-dead-center (B-TDC) at 2,000 revolutions per minute (rpm). This is done by keeping the engine running at 2,000 rpm and lining up the lines on the damper to 2 by turning the distributor.

5) Now, without turning the distributor, record the timing with the engine running at 3,500 rpm. _____

6) Explain in your own words why the timing changed:

7) Now change the dwell to 35.

8) Record the timing now with the engine running at 2,000 rpm. _____

9) Why did the timing change when the dwell changed?

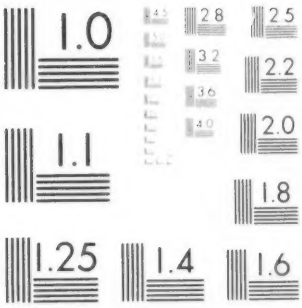
10) If you were tuning-up a car, what would you adjust first the timing or the dwell? _____

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Automotive Technician

LESSON OBJECTIVE Students will be able to construct and explain the principles behind the D.C. electric motor

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
The principles of the D.C. starter motor	Constructing a D.C. motor	1. Scraps of wood 2. Enameled wire 3. Nails 4. Paper clips 5. Directions	90 minutes	Students will be able to successfully construct the D.C. motor.



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Drafter

LESSON OBJECTIVE The students will be able to sketch a solid block using the orthographic technique.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. The ability to see an object in orthographic form 2. The ability to sketch an object using the orthographic technique	Sketching several blocks using the orthographic technique	1. Solid blocks 2. Paper & pencils	1 hour	Evaluation will be on the quality of the students drawings

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students how to use some basic electrical/electronic hand tools and to work with wire.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Diagonal cutters a. proper use of b. safety with 2. Long-nose pliers 3. Wire strippers 4. Wire a. types b. uses c. cutting d. stripping e. splicing	Students learn to perform the following splices: a. tap b. pig-tail c. Western-Union	18 guage, plastic-insulated, solid, copper wire Wire strippers Diagonal cutters Long-nose pliers	1 hour	Splices should be mechanically tight. Wires should not be nicked by cutters or strippers. (observation)

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students the technique of soldering wire and using associated tools and supplies.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Soldering iron a. care of b. proper use of 2. Sponge 3. Solder 4. Iron's stand	Students learn how to properly solder wires together.	Soldering iron Solder Stand Sponge Spliced wires from previous exercise	30 minutes	Soldered splices should be coated with a thin, continuous, and shiny layer of solder. Too much solder; too little solder; and poorly soldered connections due to insufficient heating before applying the solder, are common student pitfalls with this exercise. (observation)

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students the proper methods to tape up wire connections.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Electrical Tape a. characteristics b. reasons for use c. proper use of	Students learn how to tape up: a. Pig-tail splice b. Tap-splice c. Western-Union splice	Electrical tape Wire cutters or knife or scissors Spliced wires from previous exercise	30 minutes	Taped splices should not exhibit thick bunching-up of tape, bare spots, or loose wrappings. Essentially, the splice should be taped so as to be waterproof. (observation)

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students how to construct a simple circuit, Kirchoff's law of voltage drops, and how to make voltage measurements in a circuit.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Constructing a circuit a. connections b. following a schematic 2. Kirchoff's Law (voltage drops) 3. Voltage measurement (use of voltmeter)	Students build a simple series circuit with a battery and 3 resistors from a schematic diagram. Then the students use a voltmeter and measure all 3 voltage drops across the resistors plus the supply voltage. All results are recorded and handed in.	3 different valued ½ watt resistors (e.g., 100Ω, 470Ω, and 820Ω) 6 volt battery voltmeter/multimeter	30 minutes	The 3 voltage drops across the resistors should add up to the 6 volt supply voltage (Kirchoff's Law) if the experiment was done correctly. Results are handed in on a piece of paper.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students the use of an ammeter and how current flows in series and parallel circuits.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Constructing a circuit a. connections b. following a schematic 2. Current measurement (use of ammeter) 3. Current flow laws in a circuit 4. Parallel and series circuits a. identification b. differences c. characteristics	Students construct both series and parallel circuits with 3 resistors and a battery for each. Current is measured at all points in both circuits. Results are recorded and then handed in.	3 different valued ½ watt resistors Ammeter/Multimeter 6 volt battery	30 to 45 minutes	Current in the series circuit should be the same for every measurement at every point in the circuit. The sum of the currents measured in the parallel circuit (3 resistor legs) is equal to the total current flowing in the circuit. Students' results should bear out these facts.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students how to use an ohmmeter and make accurate resistance measurements.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Ohmmeter a. zeroing b. reading c. proper use of 2. Resistors a. color codes b. wattage ratings c. measuring	Students use an ohmmeter or multimeter to measure 5 different resistors. Color code of each resistor and its measured value is recorded on a piece of paper.	5 different valued resistors (preferably all diferent by a multiplication facotr of 10) Ohmmeter/multimeter	10 to 20 minutes	The recorded color code of each resistor tells the teacher if the student's measurements were correct (students know about color code but do not know it from memory). Each measurement is worth 20 possible points.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students the basic differences between parallel and series circuits and more about the relationships between voltage and current in a circuit

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Constructing a simple electrical circuit 2. Reading a schematic diagram 3. Understand the results (theory)	Students first construct a simple series - battery circuit with 2 flashlight cells, a switch, and a lamp. Then with the same materials, they construct a parallel battery circuit. Students must note on paper what happened in each case and also explain why.	For each student: 1 - 3 volt lamp 2 - 1½ volt "D" cells 1 - S.P.S.T. switch - wire	30 minutes	Students hand in a piece of paper on which their observations of the parallel and series circuits are recorded (lamp is brighter for the series-battery circuit). Also, students are asked to try to explain (theory) why what they observed happened.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

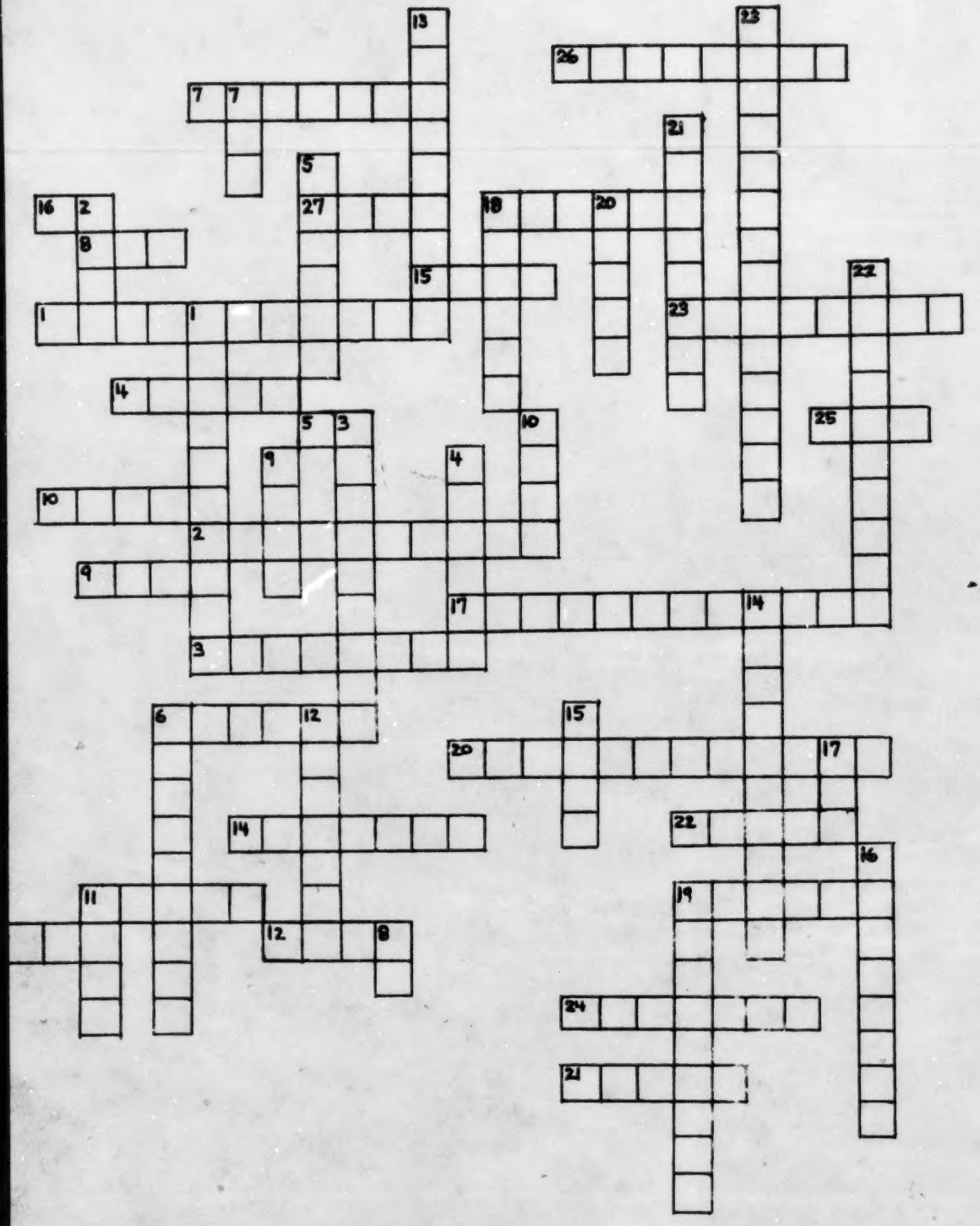
OCCUPATION Electronics Technician

LESSON OBJECTIVE To enable students to expand their vocabulary of electronic terms; both definitions and proper spelling

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
Students learn the spelling of and the definitions for 50 basic and essential electronic terms and names	Students fill out an electronics cross-word puzzle by supplying the missing words from given clues. All words used have previously been defined during various class lessons, as well as spelled out correctly on the black board.	1. clue sheet 2. cross-word puzzle sheet	30 to 60 minutes	2 points are given for each correct word filled out on the puzzle sheet; 1 point if the word is correct but a spelling error exists.

ELECTRICITY-ELECTRONICS

Cross-word Puzzle Exercise



ELECTRICITY-ELECTRONICS
CROSS-WORD PUZZLE

ACROSS

1. A phyical science dealing with the flow of electrons through wires and passive components.
2. An electronic circuit having no tubes.
3. Restricts the flow of current in circuits.
4. A part carrying a highly positive charge in a tube.
5. An extremely compact and miniaturized circuit.
6. A highly conductive metal used often in electricity.
7. Negatively-charged part of a tube.
8. Unit of resistance.
9. Unit of electrical pressure.
10. A prefix meaning 1/1000.
11. A prefix meaning 1/1,000,000.
12. The "control valve" of an electron tube.
13. The "control valve" of a bipolar transistor.
14. A group of electrical energy supply cells connected together.
15. A single electrical energy supply component.
16. The type of electrical current generated to supply power to a house.
17. A physical science dealing with the flow of electrons through wires and both passive and active components.
18. Material used to improve, strengthen, and maintain electrical connections.
19. Inside of a tube envelope; prevents heater from burning out too soon.
20. A very sensitive instrument used to measure and display alternating waveforms.
21. Current times voltage.
22. Measurement standard for wire size.
23. Instrument used to measure resistance.
24. Tool used to cut wire.
25. "Cycles-per-second . . . . .(abbrev.)"
26. The type of pliers most commonly used in electrical work.
27. Supplies a path for electrons between components in most circuits.

DOWN

1. An active electronic component. 2. An Inductor. 3. Stores a charge.
4. Generates thermal energy to aid electron flow in a tube.
5. Component used to completely stop electron flow in a circuit.
6. Part of a bipolar transistor most like the ANODE of a tube.
7. A unit of electrical current flow.
8. Type of current that flows from a battery.
9. Pre-fix meaning X1000. 10. An active component with a glass envelope.
11. Pre-fix meaning X1,000,000.
12. Part of a bipolar transistor most like the cathode of a tube.
13. The unit of this measurement is "Hertz"
14. A characteristic property of all wire coils.
15. Standard alternating current waveform.
16. Instrument used to measure electrical current flow.
17. Slang term for the power formula.
18. What you call a wrapped electrical connection between two wires.
19. Instrument used to measure electrical potential of pressure.

20. Electrical component that acts like a "check-valve" in a circuit.
21. Man who said that the sum of the voltage drops in a circuit equals the supply voltage of that circuit.
22. Tool used to remove insulation from wire.
23. Variable resistor with 3 terminals.

OCCUPATIONAL CLUSTER Technical Occupations CLUSTER OBJECTIVE NUMBER

OCCUPATION Electronics Technician

LESSON OBJECTIVE To teach students the basic construction of and understanding of simple electrical circuits, and to recognize certain standard electrical symbols for each part in the circuit.

LEARNING ACTIVITIES	STUDENT ACTIVITIES	TOOLS, EQUIP., MAT.	TIME REQ.	EVALUATION
1. Batteries a. polarity b. hooking up 2. Switches a. uses for b. types of c. hooking up 3. Rheostat a. operation of b. uses for c. hooking up 4. Lamp 5. D.C. motor 6. Schematic symbols for all of the above parts	Students follow directions and construct a number of simple electrical circuits, learn about them, and see how they operate.	Electricity exercise board with the following: 6 volt battery on/off switch normally "on" switch rheostat electric motor lamp wires to connect the above parts together with instructions & questions	1 hour	21 questions are asked one for each step of exploration the studen is instructed to perform

DC MOTOR

1. Take a red wire and connect it from the positive (+) battery post to post "A" of the MOTOR. Take a black wire and connect it from the negative (-) battery post to post "B" of the MOTOR. What happens?

2. Reverse the wires at the MOTOR; red wire now goes to MOTOR post "B" and the black wire now goes to MOTOR post "A". What happens?

3. In step #1, which direction did the MOTOR turn in, clockwise (CW) or counter-clockwise(CCW)?

4. In step #2, which direction did the MOTOR turn in, CW or CCW?

ON/OFF SWITCH

5. Allowing only the black battery wire to remain connected to the DC MOTOR, connect the red (+) wire to one of the ON/OFF SWITCH's terminal posts. Then connect a blue wire from the remaining SWITCH post to the remaining MOTOR post. Push the SWITCH into the "OFF" position. What happens?

6. Push the SWITCH to the "ON" position. What happens?

7. Reverse the wires at the SWITCH. Does this change the way the circuit works?

RED-BUTTON SWITCH

8. Disconnect the blue wire at the MOTOR post and hook it up to one of the red-button SWITCH's terminal posts. Connect a yellow wire from the remaining red-button SWITCH's terminal post to the empty MOTOR post. Push the ON/OFF SWITCH to the "ON" position. Does the circuit operate any differently than in steps 5 or 6?

9. Push down on the red button of the second SWITCH. What happens?

0. Let the red button up again. What happens?

CONTROL

1. Disconnect the yellow wire from the MOTOR post; connect it to one of the two CONTROL posts. Connect a green wire from the remaining CONTROL post to the empty MOTOR post. Rotate the CONTROL knob all the way CW (clockwise) and turn the circuit on. What happens?

2. Rotate the CONTROL knob CCW (counterclockwise). What happens?

LAMP

3. Disconnect the black and green wires from the MOTOR and connect them to the LAMP. Turn the circuit "ON". Rotate the CONTROL knob CW (clockwise). What happens?

14. Push red-button SWITCH. What happens?

15. Reverse the black and green wires connected to the LAMP. Does this change how the LAMP works?

16. Disconnect the black wire from the LAMP and connect it to one of the MOTOR terminal posts. Connect a purple wire from the empty LAMP post to the empty MOTOR post. The LAMP and MOTOR are now connected in series. Turn the ON/OFF SWITCH to "ON" and rotate the CONTROL CW (clockwise). What changes, if any, do you notice in the operation of the LAMP and the MOTOR? Look carefully.

17. Move the purple wire so that it is connected to the same MOTOR post as the black wire. Then connect a gray green wire. The MOTOR and LAMP are now connected up in parallel. What happens?

18. Draw up a schematic diagram of the circuit in step #16.

19. Draw up a schematic diagram of the circuit in step #17.

20. Explain why whatever happened in step #16 did happen.

21. Explain why whatever happened in step #17 did happen.